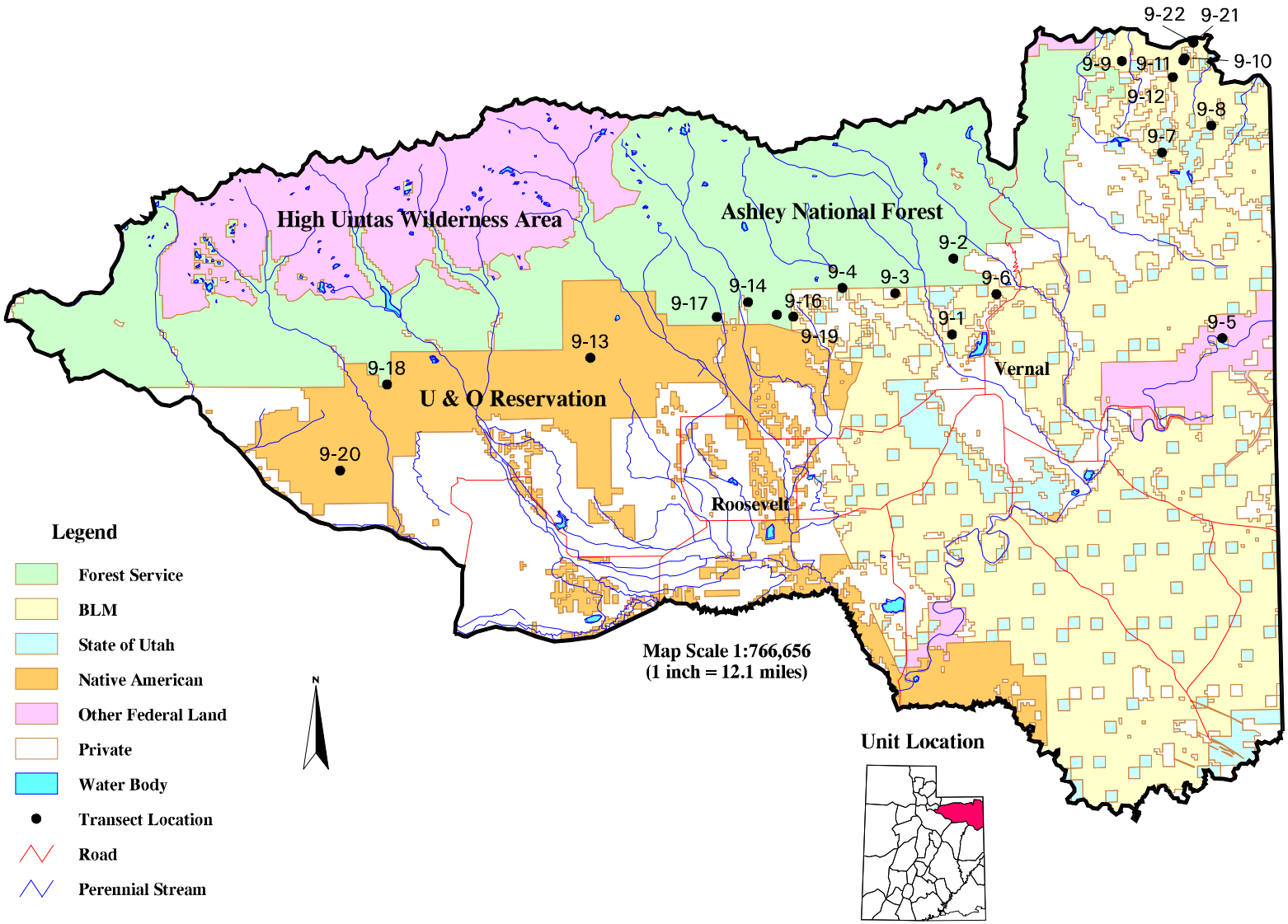
Management Unit 9



WILDLIFE MANAGEMENT UNIT 9 - SOUTH SLOPE

Boundary Description

Wasatch, Summit, Daggett, Uintah, Duchesne counties -- Boundary begins at the junction of Highway US-40 and Highway SR-87 in Duchesne; then north on SR-87 to Highway SR-35; then northwest on SR-35 to the Provo River; north along the Provo River to the North Fork Provo River; north along the North Fork Provo River to Highway SR-150; northerly along SR-150 to the Summit/Duchesne county line (summit of the Uinta Mountains); east along the summit of the Uinta Mountains to Highway SR-191; north along SR-191 to Cart Creek; northeast along Cart Creek to Flaming Gorge Reservoir; east along Flaming Gorge Reservoir to the Green River; east along the Green River to the Utah-Colorado state line; south along the Utah-Colorado state line to the White River; west along the White River to the Green River; north along the Green River to the Duchesne River; northwest along the Duchesne River to US-40 at Myton; west along US-40 to SR-87 in Duchesne and beginning point; excludes Dinosaur National Monument and all Indian Tribal Lands.

Management Unit Description

This management unit encompasses the land area of two former deer herd units, the Vernal unit (11) and the South Slope unit (12). Currently, the South Slope unit contains an estimated 2.8 million acres of deer range with summer, year-long, and winter ranges making up 40%, 35%, and 25% of this area respectively. Of all the land area classified as deer range, 32% is managed by the U.S. Forest Service, 25% by the Bureau of Land Management, and 22% are privately owned lands. In addition, 13% are Native American trust lands, and 5% are State of Utah trust lands. The South Slope unit also contains about 1.7 million acres classified as elk range. Of this amount, 64% is classified as elk summer range, 32% elk winter range, and 4% year-long range. The U.S. Forest Service and Bureau of Land Management manage 53% and 13% of the acreage classified as elk range, with private and Native American trust lands each making up 15% of the area.

Winter range within the old Vernal deer herd unit (11) is comprised mainly of closely associated areas of pinyon-juniper woodlands on the south-facing slopes and foothill benches of Diamond, Blue, and Taylor Mountains. The upper limits generally follow the 8,500 foot contour. The lower limits are defined by agricultural lands and the desert below Vernal. Winter ranges within the old South Slope (12) unit are more limiting, and management is complicated in that a large portion of these lands are part of Uintah and Ouray Indian Reservations. Summer range within the new South Slope unit are plentiful, ranging from aspen and conifer communities, to mountain big sagebrush and mountain brush communities.

Key Areas

Key areas for winter range consist of the small sagebrush/grass parks found throughout the pinyon-juniper woodlands, especially on the Vernal side of the unit. The sparse pinyon-juniper type predominates the foothills where diversity and productivity of desirable browse is usually low. Areas with a sagebrush understory or sagebrush/grass associations are more productive. Therefore, these areas normally receive more use by big game and livestock. Key areas that sample this type are Red Mountain, Dry Fork Mountain, Island Park, and Brown's Park. Key areas at Steinaker Draw, Toliver Creek, and Brown's Park sample winter range in the pinyon-juniper type, including areas that have either been chained or burned. Higher winter ranges in the mountain brush and mountain big sagebrush zones also provide important winter range for big game in this unit, especially along the south slope of the Uinta Mountains. Key areas within these vegetation types include: Little Hole, John Starr Flat, Red Pine Canyon, Mosby Mountain, Gooseberry Spring and Seep Hollow. Key areas in transitional and summer ranges are sampled on Taylor, Mosby and Diamond Mountains.

Grazing Summary

Grazing on BLM managed lands occurs under several different allotments. They are generally grazed by cattle in spring and/or summer. The Red Mountain allotment is grazed under a deferred system in either spring or fall, but not both. Dry Fork Mountain is grazed from approximately June 1 to September 15 for 470 AUM's. Actual use averages 334 AUM's per year due to a lack of water. The BLM Spring Creek allotment below Taylor Mountain has been grazed by cows in the spring (May) and late fall (November 26 to December 15) for the last 12 years. The Little Hole allotment is grazed from June 1 to October 15 for 330 AUM's. The Warren Draw allotment is permitted for 376 AUM's from May 15 to October 31. Cows use the lower areas of Browns Park on the Taylor Flat allotment in spring. The intensive annual grazing from April 1 to May 31 is planned to reduce grass-shrub competition and to promote sagebrush vigor. However, better livestock distribution is needed. Furthermore, this will not work during drought because the cattle will heavily utilize sagebrush during this grazing period when grasses are not available. There have been 1,000 AUM's permitted since 1970. The land in the drainages above Brown's Park that were burned in the 1980's are grazed only one out of every three years.

Forest Service land on Taylor Mountain is managed in a six pasture rest-rotation system with grazing occurring from June 1 to September 15. The unit in which the trend study is located supports about 500 AUM's in non-rested years for a grazing intensity of 2.9 suitable acres/AUM. The Lake Mountain allotment is grazed by 276 cows/calves from June 21 to September 30, on a four unit rest-rotation system. The Mosby Mountain allotment consists of several grazing units and has been in a rest-rotation system since 1960. Currently, this allotment is permitted for 402 cattle from June 11 to September 30. The Red Pine Canyon area is in the Whiterocks Canyon allotment and is grazed by 50 cattle on a deferred rest system. The Farm Creek allotment has a four unit rest-rotation system permitted for 576 cattle with a season of use from June ll to September 10. Gooseberry Spring falls in the Pigeon Water allotment which is grazed by 172 cattle on a rest-rotation system with a season of use from June 16 to September 25.

Big Game Herd Unit Management Objectives

Deer herd population management goals call for a wintering herd size of 25,000 animals, distributed in the following sub-populations: 12,000 animals in the Yellowstone sub-unit; and 13,000 animals in the Vernal, Bonanza and Diamond Mountain sub-units combined. The desired composition of the herd in all areas except Diamond Mountain is a post-season buck to doe ratio of 15:100 with 30% of the bucks being 3-point or better. The Diamond Mountain sub-unit will be managed for a post-season buck to doe ratio of 25:100 with the southern slope being managed as a limited entry unit.

Elk population management objectives call for a target population of 6,400 wintering animals distributed in the following sub-populations: 3,900 in the Yellowstone sub-unit; 1,300 in the Vernal/Bonanza sub-units combined; and 1,200 in the Diamond Mountain sub-unit. The desired herd composition is for a bull to cow ratio of 8:100, with at least half of the bulls being 2 ½ years of age or older. In the Diamond Mountain sub-unit (limited entry), a 5 ½ year old age class is to be maintained for harvest, with the rest of the unit being managed for general open bull hunting.

Study Site Description

Currently, this management unit contains 22 trend studies. Twelve of these existed in the old Vernal unit (11), 8 existed in the old South Slope unit (12) and 2 new studies were established in 2000. Fourteen studies were established in 1982, and 3 additional studies were established in both 1988 and 1995 in addition to the 2 new studies established in 2000 already mentioned. Depending upon when they were established, sites were re-read in 1988, 1995 and 2000. In 2000, the study at Toliver Creek in the untreated pinyon-juniper was not read

because it is in very poor condition and there was very little wildlife use. This study was originally established to compare with the adjacent Toliver Creek Chaining trend study. The study at Mud Springs Draw was also not read due to road closures and lack of access.

Trend Study 9-1-00

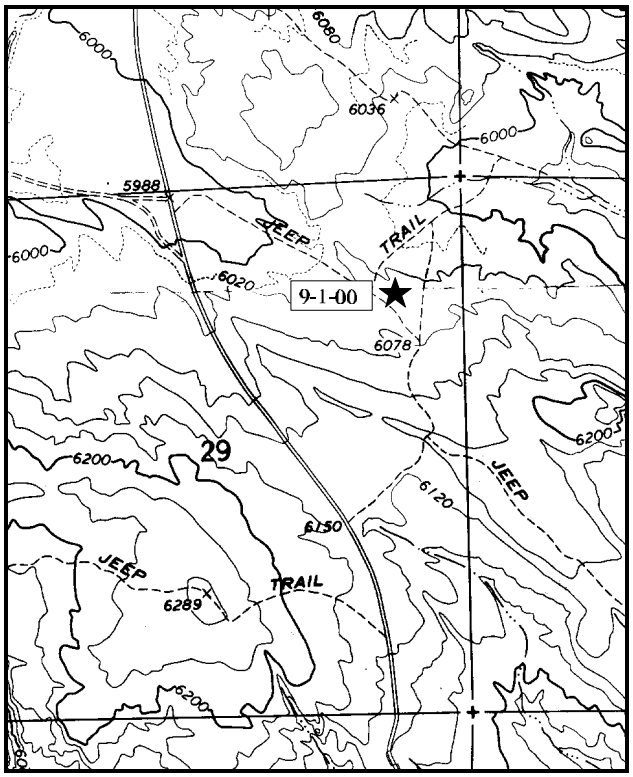
Study site name: Red Mountain Allotment . Range type: Big Sagebrush-Grass .

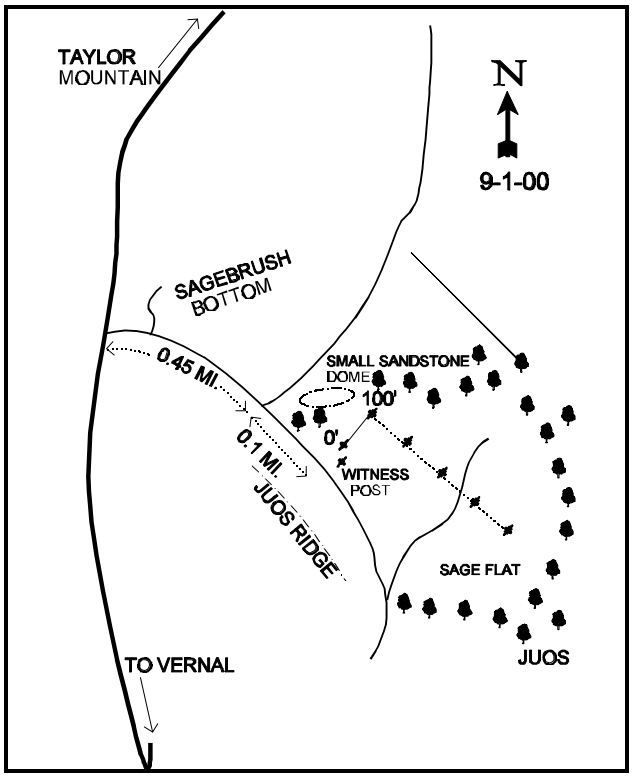
Compass bearing: frequency baseline 9°M, 105°M .

First frame Placement on frequency belts 5 feet. Frequency belt placement; line 1 (4ft), line 2 (28ft), line 3 (45ft), line 4 (77ft), line 5 (89ft).

LOCATION DESCRIPTION

From Highway 121 (500 N) west of Vernal in Maeser, go north on 2500 West for 3.25 miles to the Ashley substation. From there, continue 2.0 miles to a dirt road to the right in the sagebrush bottom. Turn and go east for 0.45 miles to a fork. Stay right and proceed just less than 0.1 miles. The 0-foot baseline stake should be visible in the sagebrush along the left side of the road. The study can also be located by walking 75 paces bearing 167°M from the east end of the sandstone dome to the 0-foot baseline stake.





Map Name: Steinaker Reservoir Diagrammatic Sketch

Township 3S , Range 21E , Section 29 UTM 4487661.851 N, 620389.985 E

DISCUSSION

Trend Study No. 9-1 (11-1)

The Red Mountain Allotment trend study is located on big game winter range above Vernal. The site supports a nearly pure stand of Wyoming big sagebrush surrounded by pinyon-juniper covered rocky ridges. The terrain at the study site slopes gently to the north (3-5%) with an elevation of just over 6,000 feet. Pellet group transect data taken along the study baseline in 2000 estimate moderate use by deer (47 deer days use/acre, 116 ddu/ha) and light use by cattle (1 cow day use/acre, 2 cdu/ha). This study is in the Red Mountain cattle allotment which is grazed in spring or fall on a deferred system.

Soils texture is a sandy loam which is moderately deep and somewhat excessively drained. Estimated effective rooting depth is over 16 inches with a relatively high average soil temperature of 70° F. Sites with high soil temperatures are more susceptible to invasion from weeds, primarily annual species. Soils are moderately alkaline (pH of 7.9) and low in organic matter. Although this site lacks continuous ground cover in the interspaces, runoff is low and the erosion hazard is slight due to the nearly flat terrain. Some pedestaling around shrubs is evident. Percent bare ground was moderately high in 1982 at 35%, but steadily declined to 21% in 1995. Due to drought in 2000, bare ground slightly increased to 25% with vegetation cover decreasing from 34% to 30%. Seventy-two percent of the vegetative cover comes from shrubs. Compared to herbaceous vegetation, shrubs are less effective at protecting against soil erosion from high intensity summer storms. An extensive cover of cryptogams (18%) provides added soil protection which is important at this site due to low herbaceous cover.

Wyoming big sagebrush is the dominant browse species, comprising 84% of the browse cover in 1995 and 90% in 2000. Sagebrush cover averages around 20%. Sagebrush density is currently estimated at 5,440 plants/acre with a relatively high rate of decadency at 65%. The current level of decadency is a dramatic increase from 15% in 1995. Although, percent decadency was nearly as high in 1988 at 53%. Percent decadency has been highly variable between sampling years since the establishment of this site in 1982. It is apparent however, that sharp fluctuations in decadency are mostly weather related as use of the sagebrush since 1988 has been mostly light to moderate. With numerous drought years since the late 1980's, sagebrush has undoubtedly been affected by the dry conditions. Currently (‘00), 37% of the decadent plants are classified as dying which represents about 1,300 plants/acre that could be lost from the population. Young recruitment is currently very low (60 plants/acre) and not adequate to replace the decadent, dying plants in the population. Coupled with high decadency in 2000, the proportion of the sagebrush population in poor vigor also increased from 6% in 1995 to 25%. The increase in poor vigor is most likely drought related as well, which has been documented on other trend studies in this unit in 2000. A return to normal precipitation would improve these downward trends on sagebrush.

All other browse species present on the site are infrequent and include: stickyleaf low rabbitbrush, prickly pear cactus, Stansbury cliffrose and prickly phlox.

Herbaceous vegetation occurs mainly under the canopy of sagebrush, leaving large bare interspaces between individual shrubs. Annual species dominate both the grass and forb components. The dominant grasses are annual cheatgrass and sixweeks fescue that account for over 80% of the grass cover in both 1995 and 2000. Sixweeks fescue sharply declined in nested frequency in 2000, while cheatgrass significantly increased. This increase in cheatgrass frequency is somewhat surprising with the dry conditions in 2000. Perennial grasses are in low abundance with 5 species being sampled in 1995 and 2000. Muttongrass and Sandberg bluegrass are the most abundant, with needle-and-thread, thickspike wheatgrass and bottlebrush squirreltail also being sampled, but occurring in low numbers. Perennial grasses decreased in sum of nested frequency in 2000 and only provide 4% of the total vegetative cover at this site. Forbs have been sparse on this site during all sampling periods.

Annual forbs were fairly abundant in 1995 with the wet spring of that year, but were infrequent in 2000 with drought. Perennial forbs are nearly non-existent with 3 species being sampled in 2000 totaling less than 1/10 of one percent average cover.

1982 APPARENT TREND ASSESSMENT

Apparent vegetative trend on this site appears stable. Plant composition is less than desirable however. The key species, Wyoming big sagebrush, shows evidence of high utilization which could eventually depress vigor and plant abundance. Soil trend appears to be declining. Of the seven applicable soil trend parameters on the evaluation checklist, five were judged as indicating a declining trend.

1988 TREND ASSESSMENT

Slight changes in ground cover measurements detected in 1988 are probably not significant. The possible exception is the increase in the cover of cryptogamic crusts. Bare soil still constitutes 30% of the ground surface, but that is an improvement from 1982 when percent bare ground was estimated at 35%. There is considerable areas of unprotected bare soil in the shrub interspaces, but serious erosion does not appear to be a significant problem on the site due to the level terrain. Trend for soil is slightly up, but in poor condition. Trend for the key browse species, Wyoming big sagebrush, is mixed. Population density has increased greatly but entirely from an increase in the decadent age class which rose from 400 plants/acre in 1982 to 5,133 by 1988. Use is currently more moderate, yet vigor has declined with 14% (733 plants/acre) of the decadent shrubs classified as dying. The data for shrub density suggests that the population has increased considerably since 1982, most likely caused by the extremely wet years of 1983 and 1984. However, sagebrush is likely poised to decline dramatically in the future if current drought conditions persist. Trend for browse is slightly down due to the high numbers of decadent individuals even though the mature population currently appears stable. The herbaceous trend is slightly up due to an increase in quadrat frequency of grasses. Forbs have remained stable.

TREND ASSESSMENT
soil - slightly up but in poor condition (4)
browse - slightly down and poised to decline due to abundant decadent sagebrush (2)
herbaceous understory - slightly up but in poor condition due to annuals (4)

1995 TREND ASSESSMENT

Ground cover characteristics have improved since 1988 with percent bare ground decreasing from almost 30% to 21%. Cryptogamic cover has also increased providing added soil protection. Even with this improvement, condition is still poor with large areas of bare ground in the shrub interspaces. Trend for browse is improved slightly. Overall density has declined considerably but the result is a smaller, healthier population. Heavy use has declined, vigor has improved, and percent decadency has declined from 53% to 15%. Recruitment is fairly good with 120 seedlings and 360 young plants/acre. Trend for the herbaceous understory is slightly down with sum of nested frequency of perennial grasses declining for three of the five species encountered. Condition of the understory is poor due to the dominance of annual grasses and forbs. Cheatgrass and sixweeks fescue make up 82% of the grass cover while 8 annual forbs contribute 99% of the forb cover. These annual grasses and forbs were not included in the 1982 and 1988 samples so no comparisons can be made.

TREND ASSESSMENT
soil - slightly up but remains in poor condition (4)
browse - slightly up (4)
herbaceous understory - slightly down, and in poor condition due to annuals (2)

2000 TREND ASSESSMENT

Trend for soil is down slightly. Percent bare ground slightly increased, but not excessively. Vegetation cover has declined slightly and sum of nested frequency of herbaceous vegetation has fallen due to drought. In addition, the ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil has also declined slightly. Very little protective ground cover is present in the interspaces between sagebrush plants, but erosion remains minimal due to the level terrain. Trend for browse is slightly down as Wyoming big sagebrush has several downward parameters. Percent decadency increased from 15% to 65% and poor vigor increased from 6% to 25% since 1995. The proportion of decadent, dying plants is moderate at 37%, representing about 1,300 plants/acre. Recruitment is low and not adequate to replace the decadent, dying portion of the population. These downward parameters are most likely the result of drought which could improve if precipitation returns to a normal level. Trend for the herbaceous understory is down and remains in poor condition. Sum of nested frequency of perennial species, which are already infrequent, decreased by half in 2000. Annual species dominate the understory at this site.

TREND ASSESSMENT
soil - slightly down (2)
browse - slightly down (2)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 1

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	b71	b53	a15	14	25	17	7	.33	.12
G	Bromus tectorum (a)	-	a251	b290	-	-	84	92	5.64	6.90
G	Oryzopsis hymenoides	2	-	-	-	1	-	-	-	-
G	Poa fendleriana	b111	a51	a45	10	52	23	20	.66	.35
G	Poa secunda	a-	b17	c47	-	-	8	20	.40	.61
G	Sitanion hystrix	c50	b25	a4	13	27	13	2	.23	.03
G	Stipa comata	3	3	2	1	1	2	2	.06	.03
G	Vulpia octoflora (a)	-	b252	a31	-	-	84	13	1.82	.09
Total for Annual Grasses		0	503	321	0	0	168	105	7.47	6.99
Total for Perennial Grasses		237	149	113	38	106	63	51	1.69	1.15
Total for Grasses		237	652	434	38	106	231	156	9.17	8.14
F	Allium spp.	B12	b11	a-	2	5	5	-	.02	-
F	Androsace septentrionalis (a)	-	4	-	-	-	2	-	.01	-
F	Calochortus nuttallii	1	2	-	4	1	2	-	.01	-
F	Chaenactis spp.	-	2	-	-	-	1	-	.00	-
F	Chenopodium leptophyllum (a)	-	b16	a-	-	-	9	-	.04	-
F	Collinsia parviflora (a)	-	3	-	-	-	1	-	.00	-
F	Cryptantha spp.	A2	b18	a-	17	2	9	-	.07	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Descurainia pinnata (a)	-	$_{b}$92	$_{a}$-	-	-	40	-	.25	-
F	Eriogonum cernuum (a)	-	2	-	-	-	1	-	.00	-
F	Erigeron pumilus	$_{a}$-	$_{b}$8	$_{ab}$2	-	-	4	1	.02	.00
F	Gilia spp. (a)	-	16	7	-	-	7	3	.03	.01
F	Lappula occidentalis (a)	-	3	3	-	-	1	2	.00	.03
F	Lepidium montanum	12	13	12	1	6	8	5	.06	.07
F	Machaeranthera canescens	$_{b}$6	$_{c}$16	$_{a}$-	1	3	9	-	.04	-
F	Oenothera pallida	-	1	-	-	-	1	-	.00	-
F	Orobanche fasciculata	3	-	-	-	1	-	-	-	-
F	Phlox longifolia	3	11	-	-	1	5	-	.05	-
F	Plantago patagonica (a)	-	$_{b}$207	$_{a}$94	-	-	73	39	1.23	.27
F	Polygonum douglasii (a)	-	2	-	-	-	1	-	.00	-
F	Schoencrambe linifolia	$_{a}$-	$_{b}$5	$_{ab}$6	-	-	3	2	.04	.01
F	Senecio multilobatus	-	-	-	-	-	-	-	-	.00
F	Unknown forb-perennial	1	-	-	-	1	-	-	-	-
Total for Annual Forbs		0	345	104	0	0	135	44	1.59	0.32
Total for Perennial Forbs		40	87	20	25	20	47	8	0.33	0.09
Total for Forbs		40	432	124	25	20	182	52	1.93	0.41

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 1

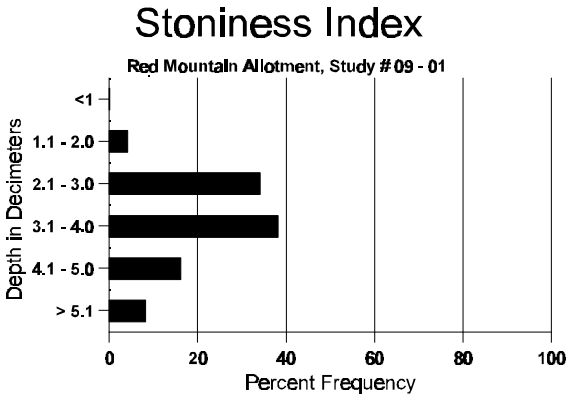
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	90	96	21.34	20.20
B	Chrysothamnus viscidiflorus viscidiflorus	40	34	4.00	2.15
B	Leptodactylon pungens	1	0	.15	-
B	Opuntia spp.	2	3	-	-
Total for Browse		133	133	25.50	22.36

BASIC COVER --
Herd unit 09 , Study no: 1

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	351	323	4.0	3.25	34.27	30.36
Rock	12	-	9.50	0	.02	0
Pavement	7	21	1.25	0	.01	.06
Litter	398	360	68.75	55.50	43.87	43.37
Cryptogams	259	293	4.25	11.75	15.97	18.43
Bare Ground	281	298	35.25	29.50	21.13	25.96

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 1, Study Name: Red Mountain Allotment

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
16.39	70.0 (17.56)	7.9	77.0	12.7	10.3	0.6	6.3	64.0	0.6



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 1

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	14	65	400	N/A
Elk	2	1	-	-
Deer	47	30	609	47 (116)
Cattle	-	1	9	1 (2)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 1

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	95	5	-	-	1	-	-	-	-	-	6	-	-	-	120			6
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	88	1	1	-	2	-	-	-	-	-	4	-	-	-	266			4
	95	17	1	-	-	-	-	-	-	-	18	-	-	-	360			18
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	82	10	25	35	-	-	-	-	-	-	65	3	2	-	4666	23	26	70
	88	26	27	11	-	-	-	-	-	-	58	2	4	-	4266	24	21	64
	95	73	68	5	-	8	8	6	-	-	168	-	-	-	3360	33	42	168
	00	61	26	3	2	-	-	-	-	-	91	-	1	-	1840	29	31	92
D	82	-	1	5	-	-	-	-	-	-	-	4	1	1	400			6
	88	30	32	14	1	-	-	-	-	-	52	1	13	11	5133			77
	95	15	7	5	1	1	-	3	-	-	20	-	-	12	640			32
	00	116	49	4	7	-	-	1	-	-	111	-	-	66	3540			177
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	980			49
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	1380			69

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	34%	52%	05%	+47%
'88	41%	17%	19%	-55%
'95	39%	08%	06%	+20%
'00	28%	03%	25%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	5132		8%
	'88	9665		53%
	'95	4360		15%
	'00	5440		65%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	41	-	-	2	-	-	-	-	-	43	-	-	-	860	23	32	43
	00	29	-	-	2	-	-	2	-	-	33	-	-	-	660	18	22	33
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	3	-	-	1	-	-	-	-	-	3	-	-	1	80			4
	00	10	-	-	3	-	-	1	-	-	8	-	-	6	280			14
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	02%	+ 2%
'00	00%	00%	12%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	0	Dec:		0%
'88	0			0%
'95	1000			8%
'00	1020			27%

Cowania mexicana stansburiana																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	30	41	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	0	Dec:	-
'88	0		-
'95	0		-
'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	12	23	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	0	Dec:		-
'88	0			-
'95	0			-
'00	0			-

Juniperus osteosperma																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	1	-	-	-	-	-	-	-	1	-	-	-	66	36	15	1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	100%	00%	00%	+ 0%
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	66	Dec:	-
'88	66		-
'95	0		-
'00	0		-

Leptodactylon pungens																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	5	19	3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	0	Dec:	-
'88	0		-
'95	60		-
'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	1	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	4	16	1
	88	3	-	-	2	-	-	-	-	-	5	-	-	-	333	3	6	5
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	4	13	2
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	3	7	3
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+83%
'88	00%	00%	00%	-90%
'95	00%	00%	00%	+60%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	66	Dec:	0%
	'88	399		0%
	'95	40		0%
	'00	100		40%

Trend Study 9-2-00

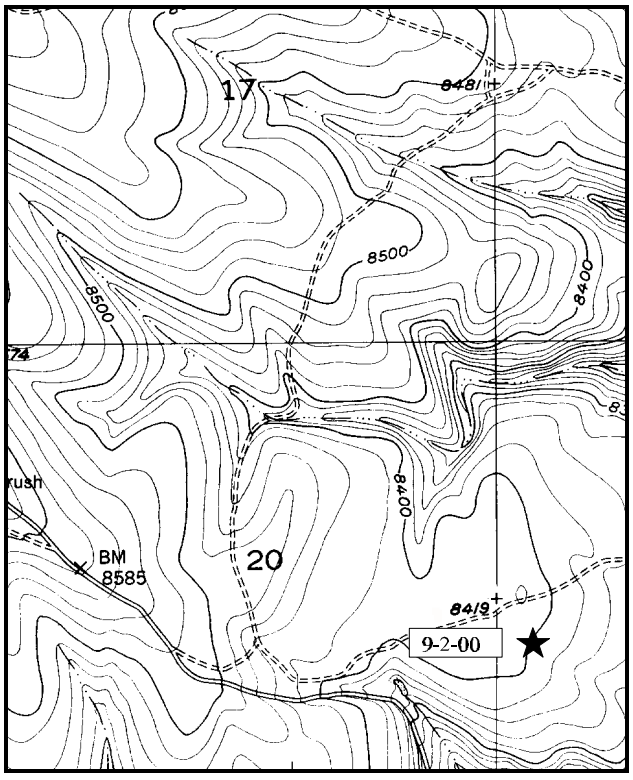
Study site name: Taylor Mountain . Range type: Big Sagebrush-Grass .

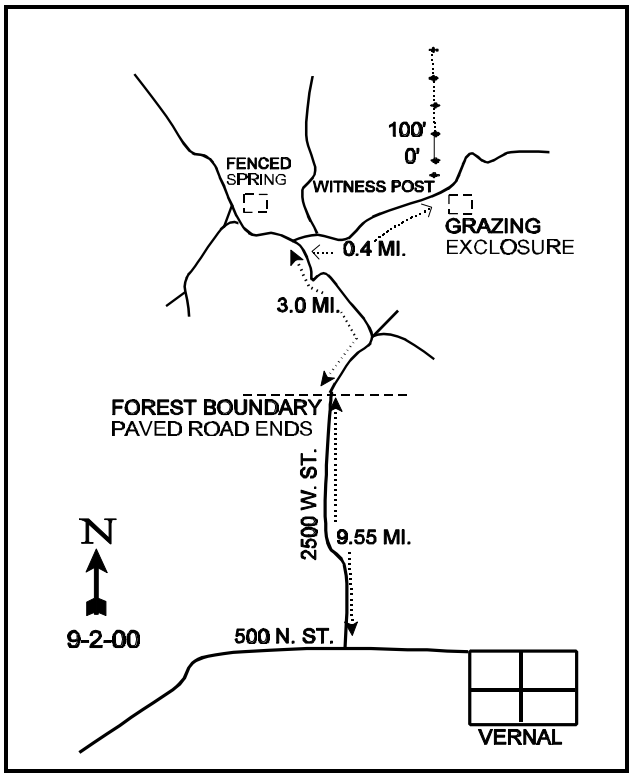
Compass bearing: frequency baseline 0°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (14 & 82ft), line 2 (28ft), line 3 (59ft), line 4 (77ft).

LOCATION DESCRIPTION

From Vernal, travel west on 500 North Street to 2500 West. Turn right on 2500 West and drive north 9.55 miles to the National Forest boundary. Continue north 3 miles to a fork. Turn right and go 0.4 miles towards the Taylor Mountain Exclosure. From the sign on the west side of the exclosure, walk 54 paces north to the 0-foot end of the baseline. There is also a witness post 4 feet south of the 0-foot stake. It is marked by an 18 inch tall fencepost with browse tag #7091 attached.





Map Name: Dyer Mountain

Diagrammatic Sketch

Township 2S , Range 21E , Section 20

UTM 4498233.176 N, 620580.650 E

DISCUSSION

Trend Study No. 9-2 (11-2)

The Taylor Mountain trend study is adjacent to the Taylor Mountain Exclosure which was built in 1962. This site can best be classified as spring-fall range. Elevation on the broad open ridge top is 8,400 feet with a gentle east facing slope of 1% to 5%. The Forest Service land on Taylor Mountain is managed in a 6-pasture rest-rotation system with grazing occurring from June 1 to September 15. The grazing unit in which the trend study is located supports about 500 AUM's during years of non-rest. A pellet group transect read along the study site baseline in 2000 estimates only 4 cow days use/acre (9 cdu/ha). Wildlife use is moderate for deer at 38 deer days use/acre (94 ddu/ha) and light for elk at 13 elk days use/acre (31 edu/ha).

Soils are a dark clay loam to loam and are moderately shallow in depth with an estimated effective rooting depth of just over 9 inches. A profile stoniness index estimated from penetrometer readings shows nearly 90% of the rocks occur within the top 8 inches of soil. Phosphorus is low at 4.5 ppm as 10 ppm may limit normal plant growth and development. Active erosion is slight due to the level terrain. Vegetation and litter cover are also excellent being estimated at 62% and 71% in 2000 respectively. Percent bare ground is relatively low at 8%.

Browse is not as critical on this site as it is not true winter range, but a dense stand of mountain big sagebrush and antelope bitterbrush are present. These species provide 64% and 28% of the browse cover respectively in 2000. Sagebrush cover is currently estimated at 26%, with an estimated density of 5,120 plants/acre. Utilization was estimated much lower in 2000 with only 10% of the population displaying moderate use and no heavy use identified. This was a significant decrease from 72% moderate use and 12% heavy use in 1995. Percent decadency increased from 4% in 1995 to 22% in 2000. However, in the past it has been as high as 19%. The proportion of decadent, dying individuals is moderate at 21% (240 plants/acre), but recruitment is currently good at 220 plants/acre. This should be adequate to replace individuals that may be lost to die-off. Vigor has been generally good in all sampling years, and even with drought in 2000, poor vigor remains low at 5%. Average leader growth is just under 5 inches in 2000, with good seed production on mature plants.

Antelope bitterbrush is also an important forage species on this site with an estimated density of 2,620 plants/acre in 1995 and 2,500 plants/acre in 2000. The population has a prostate growth form that measures only 16 inches in height. The population has generally been vigorous and healthy in the past, with utilization being determined as moderate most years. In 2000, poor vigor increased from 2% to 12%, while percent decadency increased from 3% to 30% since 1995. Recruitment is currently good at 9% (220 plants/acre). With the level of use on bitterbrush at this site (52% heavy use in 2000), it would be easy to attribute the increases in decadency and poor vigor solely on use. However, with extended drought and low annual leader growth, heavy use may have been overestimated in 2000. Drought most likely plays a major role in the current increases in decadency and poor vigor of bitterbrush. Also, the dense stand of sagebrush causes strong competition between the species, this may further increase percent decadency and poor vigor with any further drought. Use of bitterbrush was also intensified in 2000 due to the droughts effect to the herbaceous understory.

Other browse encountered on the site includes: mountain low rabbitbrush, snowberry, serviceberry and true mountain mahogany. Both serviceberry and mahogany are heavily utilized and in low abundance. Serviceberry, bitterbrush and mahogany are all more abundant inside the exclosure compared to outside. Seed production for these species appeared to be similar whether inside or outside of the exclosure. However, plant stature was much better inside the exclosure.

The herbaceous understory is diverse and moderately abundant with grasses producing over 12% cover and forbs contributing 17% cover in 2000. The dominant grasses are thickspike wheatgrass, muttongrass and bottlebrush squirreltail. Thickspike was previously not sampled, but picked up with the much larger sample

used in 1995. Forbs are exceptionally diverse with over 40 species being sampled in 1995 and 2000. Perennial forbs are dominant and include: rose pussytoes, ballhead sandwort, tapertip hawksbeard, silver lupine and rock goldenrod. Sum of nested frequency of both perennial grasses and forbs decreased slightly in 2000, mostly due to drought. However, the dense stand of mountain big sagebrush providing 26% cover is also suppressing the understory somewhat. As this is not critical winter range, some type of treatment, most likely a prescribed burn to decrease sagebrush density and cover should be considered in the future. This would help improve the abundance of herbaceous species in the understory. Grasses appeared to be more abundant and more robust inside the exclosure compared to the transect located outside the exclosure.

1982 APPARENT TREND ASSESSMENT

Both vegetative and soil trends appear stable or improving. Utilization of the key browse species is not excessive and there appears to be adequate replacement of decadent or dead plants. Herbaceous understory composition and production is fair, but there is need for improvement.

1988 TREND ASSESSMENT

An increase in percent litter cover was noted, resulting in more than 88% total ground cover in 1988. The dense vegetative cover on the site provides excellent soil protection. The slight soil movement is not significant and there is little net loss of soil. Trend for soil is up. Trend for the key browse species, mountain big sagebrush and bitterbrush, is up due to increasing population densities, good numbers of young plants, and low decadency rates. Trend for the herbaceous understory is also up due to increased quadrat frequency of grasses and forbs.

TREND ASSESSMENT
soil - up (5)
browse - up (5)
herbaceous understory - up (5)

1995 TREND ASSESSMENT

Soil conditions continue to improve on the site. Bare ground declined from 12% to 7%. Litter cover declined from 77% to 65%, but this trend is common during the statewide extended drought. The browse trend is stable overall, being stable for sagebrush and slightly improved for bitterbrush. Sagebrush density has declined since 1988, but the number of mature plants is relatively stable, percent decadency is low and vigor is good. The number of dead plants is relatively low (300), indicating that the change in density is partly due to the much larger sample used in 1995. Recruitment of young is moderate at 8%. The only negative aspect of the sagebrush population is the higher use reported in 1995. Antelope bitterbrush is also more heavily utilized but has increased in density, has a lower decadency rate, and has an adequate number of young plants. The herbaceous understory has remained stable since the last reading. Grasses declined slightly in sum of nested frequency, while forbs have increased slightly.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable overall (3)
herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is stable. Bare ground remains relatively low. Protective ground cover from vegetation and litter are abundant and well distributed. Trend for browse is stable although sagebrush and bitterbrush display increased poor vigor and decadence in 2000. Drought and competition, more than any other factors, likely

combined to cause increases in decadency and poor vigor for these species. Even with reduced health, these species remain at relatively stable densities. Some type of treatment such as a prescribed burn to decrease the dense stand of sagebrush and increase perennial herbaceous species should be considered in the future. The herbaceous understory slightly decreased in perennial sum of nested frequency in 2000, but has a stable trend as the most abundant perennial species remained at stable frequencies.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 2

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a-	b157	b171	-	-	62	63	1.12	2.01
G	Agropyron spicatum	a-	a2	b7	-	-	1	3	.03	.09
G	Bouteloua gracilis	-	3	-	-	-	1	-	.00	-
G	Bromus anomalus	a-	a-	b15	-	-	-	6	-	.52
G	Bromus tectorum (a)	-	3	-	-	-	1	-	.00	-
G	Carex spp.	a-	b7	b20	-	-	4	9	.02	.41
G	Festuca ovina	3	19	15	5	2	9	9	.09	.17
G	Koeleria cristata	b46	a18	a5	33	18	6	2	.08	.06
G	Poa fendleriana	ab173	a154	b206	29	65	54	75	1.96	7.09
G	Poa pratensis	b22	a50	a12	1	8	20	5	.99	.27
G	Poa secunda	b77	a1	a20	48	34	1	10	.00	.24
G	Sitanion hystrix	c177	b106	a39	25	71	41	15	1.57	.66
G	Stipa comata	b90	a46	a30	9	38	15	11	.30	.62
G	Stipa lettermani	b76	ab56	a28	41	34	24	12	.39	.55
Total for Annual Grasses		0	3	0	0	0	1	0	0.00	0
Total for Perennial Grasses		664	619	568	191	270	238	220	6.58	12.74
Total for Grasses		664	622	568	191	270	239	220	6.59	12.74
F	Agoseris glauca	a-	ab4	b9	-	-	2	6	.01	.10
F	Antennaria rosea	b107	a59	a54	14	41	25	23	1.67	.99
F	Androsace septentrionalis (a)	-	b20	a2	1	-	9	1	.04	.00
F	Arabis spp.	b45	a16	a9	4	23	7	4	.06	.02
F	Arenaria congesta	a112	b216	b208	22	42	69	73	2.62	5.02
F	Aster chilensis	a-	b16	b15	-	-	8	6	.04	.10
F	Astragalus convallarius	15	5	3	7	7	3	2	.04	.18
F	Astragalus tenellus	-	6	1	-	-	2	1	.06	.03

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Astragalus spp.	-	2	5	1	-	1	2	.00	.01
F	Balsamorhiza hookeri	72	72	87	54	35	37	46	.73	1.38
F	Castilleja flava	-	2	4	-	-	1	2	.00	.01
F	Castilleja linariaefolia	15	14	5	2	9	6	3	.03	.06
F	Cirsium spp.	-	3	-	-	-	1	-	.00	-
F	Collomia linearis (a)	-	$_{b}$69	$_{a}$12	-	-	34	6	.17	.10
F	Comandra pallida	3	4	9	5	3	2	3	.03	.01
F	Collinsia parviflora (a)	-	$_{b}$78	$_{a}$25	-	-	31	14	.15	.09
F	Crepis acuminata	$_{a}$-	$_{b}$17	$_{b}$11	-	-	7	5	1.06	.08
F	Cryptantha spp.	-	2	-	-	-	2	-	.01	-
F	Draba spp. (a)	-	1	4	7	-	1	2	.00	.01
F	Eriogonum alatum	-	1	-	-	-	1	-	.00	-
F	Erigeron eatonii	$_{a}$-	$_{a}$-	$_{b}$50	-	-	-	24	-	.22
F	Erigeron flagellaris	$_{c}$100	$_{b}$42	$_{a}$1	38	48	21	1	.13	.00
F	Erigeron pumilus	-	-	5	-	-	-	2	-	.01
F	Eriogonum racemosum	-	-	3	-	-	-	1	-	.03
F	Eriogonum umbellatum	58	63	39	23	23	28	19	.83	.75
F	Gayophytum ramosissimum (a)	-	3	-	-	-	1	-	.00	-
F	Hymenoxys acaulis	-	3	-	-	-	1	-	.03	-
F	Ipomopsis aggregata	5	4	-	-	2	2	-	.01	-
F	Lesquerella spp.	-	5	5	-	-	2	3	.01	.01
F	Lithospermum spp.	-	1	-	-	-	1	-	.00	-
F	Lomatium spp.	$_{a}$-	$_{b}$19	$_{b}$17	1	-	9	9	.09	.09
F	Lupinus argenteus	$_{a}$18	$_{b}$80	$_{b}$82	12	10	35	37	1.79	2.37
F	Lychnis drummondii	-	-	-	2	-	-	-	-	-
F	Mertensia spp.	$_{a}$-	$_{b}$8	$_{a}$-	-	-	4	-	.02	-
F	Penstemon humilis	$_{a}$-	$_{b}$40	$_{b}$14	-	-	19	7	.12	.08
F	Penstemon spp.	$_{c}$100	$_{b}$10	$_{a}$-	39	49	5	-	.02	-
F	Petradoria pumila	$_{b}$94	$_{ab}$59	$_{a}$37	29	40	29	19	1.12	1.08
F	Phlox austromontana	$_{b}$93	$_{a}$23	$_{a}$40	47	39	12	21	.10	1.22
F	Phlox longifolia	50	60	79	-	25	25	33	.32	1.31
F	Polygonum douglasii (a)	-	$_{b}$165	$_{a}$3	-	-	58	1	.36	.00
F	Potentilla gracilis	$_{a}$12	$_{b}$28	$_{ab}$23	14	6	16	13	.10	.11
F	Senecio debilis	$_{b}$101	$_{a}$33	$_{a}$20	7	47	17	12	.08	.21
F	Sedum lanceolatum	$_{a}$-	$_{c}$51	$_{b}$17	31	-	21	9	.25	.11
F	Senecio multilobatus	-	2	4	-	-	1	3	.00	.01
F	Streptanthus cordatus	-	4	-	-	-	1	-	.00	-
F	Taraxacum officinale	$_{a}$-	$_{c}$33	$_{b}$15	-	-	14	6	.15	.05

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Trifolium gymnocarpon	$_{a}$14	$_{b}$131	$_{b}$109	19	5	49	45	.54	1.13
F	Unknown forb-annual (a)	-	$_{b}$8	$_{a}$-	-	-	3	-	.01	-
F	Unknown forb-perennial	$_{b}$11	$_{a}$-	$_{a}$-	-	5	-	-	-	-
F	Zigadenus elegans	$_{a}$-	$_{b}$14	$_{b}$11	-	-	8	5	.05	.19
Total for Annual Forbs		0	344	46	8	0	137	24	0.75	0.21
Total for Perennial Forbs		1025	1152	991	371	459	494	445	12.23	17.09
Total for Forbs		1025	1496	1037	379	459	631	469	12.99	17.31

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 2

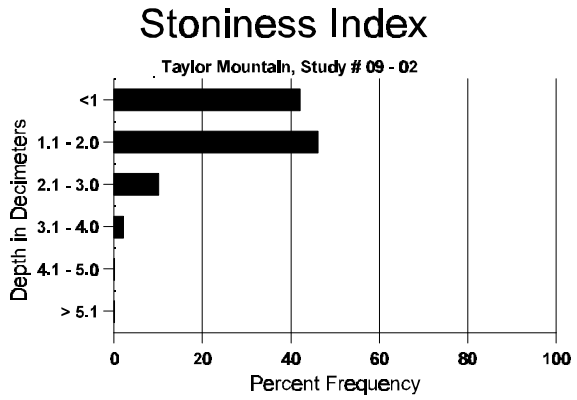
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	1	1	.00	.15
B	Artemisia tridentata vaseyana	91	94	22.71	26.12
B	Cercocarpus montanus	2	2	.15	.38
B	Chrysothamnus viscidiflorus lanceolatus	24	18	.60	1.22
B	Purshia tridentata	75	70	14.75	11.55
B	Symphoricarpos oreophilus	11	14	.56	1.50
Total for Browse		204	199	38.78	40.95

BASIC COVER --
Herd unit 09 , Study no: 2

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	381	360	11.00	7.25	50.54	61.97
Rock	53	21	.50	.75	.58	.13
Pavement	123	102	4.25	3.25	2.70	1.94
Litter	399	387	63.75	77.25	65.15	71.75
Cryptogams	48	47	0	0	1.87	1.22
Bare Ground	122	149	21.00	11.50	6.45	7.75

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 2, Study Name: Taylor Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.53	55.0 (11.81)	7.2	37.4	36.0	26.6	5.0	4.5	153.6	1.3



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 2

Type	Quadrat Frequency '95	Quadrat Frequency '00	Pellet Transect: Pellet Groups per Acre '00	Pellet Transect: Days Use per Acre (ha) '00
Rabbit	2	6	104	N/A
Elk	8	3	165	13 (31)
Deer	21	20	505	39 (96)
Cattle	3	-	44	5 (9)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 2

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	1	-	-	-	-	1	-	-	-	20	31	43	1
	00	-	-	-	-	-	1	-	-	-	1	-	-	-	20	30	28	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	100%	00%	00%	+ 0%
'00	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	0		-
	'88	0		-
	'95	20		-
	'00	20		-

Artemisia tridentata vaseyana																		
S	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	8	-	-	1	-	-	-	-	-	9	-	-	-	180			9
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	82	18	-	-	-	-	-	-	-	-	18	-	-	-	1200			18
	88	14	1	-	-	-	-	-	-	-	15	-	-	-	1000			15
	95	14	5	-	-	-	-	-	-	-	19	-	-	-	380			19
	00	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
M	82	31	8	-	-	-	-	-	-	-	39	-	-	-	2600	23	29	39
	88	60	9	1	-	-	-	-	-	-	70	-	-	-	4666	23	26	70
	95	22	156	24	-	-	-	-	-	-	202	-	-	-	4040	24	39	202
	00	163	15	-	9	2	-	-	-	-	187	2	-	-	3780	27	37	189
D	82	13	-	-	-	-	-	-	-	-	10	3	-	-	866			13
	88	11	2	-	-	-	-	-	-	-	13	-	-	-	866			13
	95	-	6	4	-	-	-	-	-	-	9	-	-	1	200			10
	00	43	9	-	3	-	-	1	-	-	44	-	-	12	1120			56
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	300			15
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	300			15

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	11%	00%	00%	+29%
'88	12%	01%	00%	-29%
'95	72%	12%	.43%	+10%
'00	10%	00%	05%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	4666		19%
	'88	6532		13%
	'95	4620		4%
	'00	5120		22%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	2	-	-	-	-	-	-	2	-	-	-	40	32	41	2
	00	-	-	-	-	-	2	-	-	-	2	-	-	-	40	27	34	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	100%	00%	+ 0%
'00	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	40		-
	'00	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus lanceolatus																		
Y	82	9	-	-	-	-	-	-	-	-	9	-	-	-	600			9
	88	16	-	-	-	-	-	-	-	-	16	-	-	-	1066			16
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	14	-	-	-	-	-	-	-	-	14	-	-	-	933	17	14	14
	88	21	1	-	1	-	-	-	-	-	23	-	-	-	1533	10	11	23
	95	28	-	-	2	-	-	-	-	-	30	-	-	-	600	11	13	30
	00	28	-	1	-	-	-	-	-	-	29	-	-	-	580	15	15	29

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+41%
'88	03%	00%	00%	-77%
'95	00%	00%	00%	- 3%
'00	00%	03%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	1533	Dec:	-
	'88	2599		-
	'95	600		-
	'00	580		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
S	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	88	4	-	-	-	1	-	-	-	-	5	-	-	-	333			5
	95	6	6	-	-	3	-	-	-	-	15	-	-	-	300			15
	00	5	1	1	-	3	-	1	-	-	10	-	1	-	220			11
M	82	7	13	6	-	-	-	-	-	-	26	-	-	-	1733	13	27	26
	88	-	18	4	1	-	1	-	-	-	24	-	-	-	1600	16	24	24
	95	2	34	47	-	29	-	-	-	-	112	-	-	-	2240	16	42	112
	00	4	3	17	3	9	27	13	-	-	75	1	-	-	1520	16	37	76
D	82	-	1	-	-	-	-	-	-	-	-	1	-	-	66			1
	88	1	4	-	-	-	-	-	-	-	5	-	-	-	333			5
	95	1	3	-	-	-	-	-	-	-	1	-	-	3	80			4
	00	-	2	8	2	11	12	3	-	-	23	1	1	13	760			38
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	45%	19%	00%	+ 9%
'88	68%	15%	00%	+14%
'95	57%	36%	02%	- 5%
'00	23%	52%	12%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'82	2065	3%
	'88	2266	15%
	'95	2620	3%
	'00	2500	30%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	3	-	-	-	-	-	4	-	-	-	80			4
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20			1
M	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266	19	11	4
	88	3	-	-	2	-	-	-	-	-	4	-	1	-	333	14	16	5
	95	3	-	-	14	-	-	-	-	-	17	-	-	-	340	14	37	17
	00	7	-	-	4	1	-	2	-	-	14	-	-	-	280	16	39	14
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	1	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+50%
'88	00%	00%	13%	-29%
'95	00%	00%	00%	-16%
'00	13%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
'82	266		0%
'88	532		12%
'95	380		0%
'00	320		6%

Trend Study 9-3-00

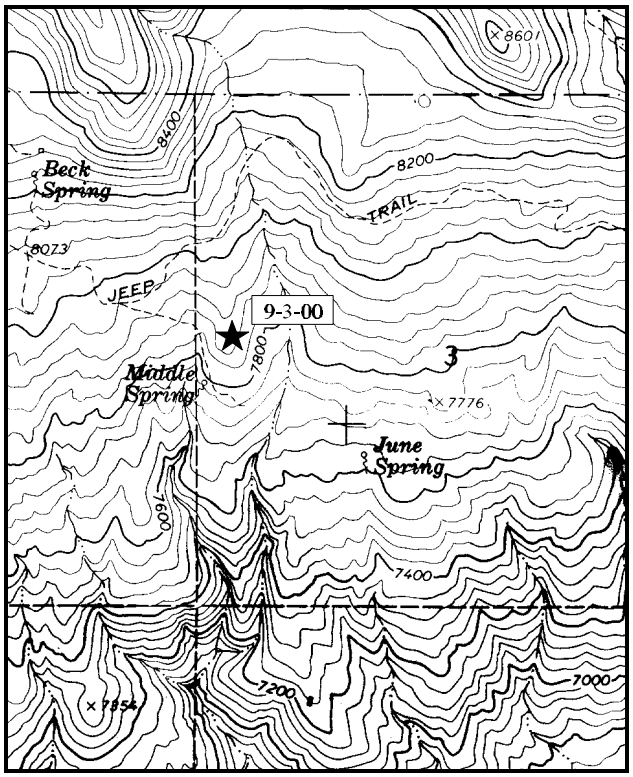
Study site name: Dry Fork Mountain . Range type: Big Sagebrush-Grass .

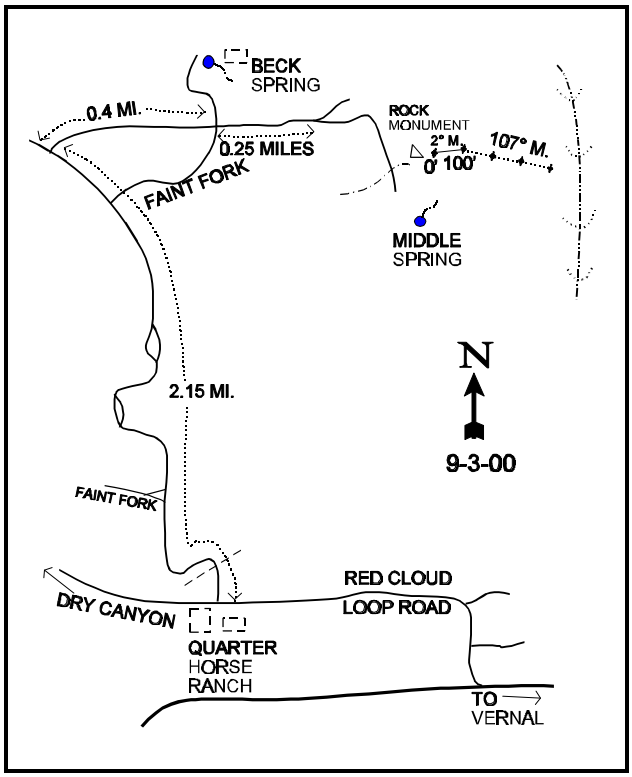
Compass bearing: frequency baseline 83°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (18 & 81ft), line 2 (33ft), line 3 (66ft), line 4 (79ft).

LOCATION DESCRIPTION

From Vernal, proceed west on 500 North to 3500 West. Turn right and go up Dry Fork 8.5 miles to the Red Cloud Loop Road. Bear right onto this road and continue up Dry Fork Canyon 1.7 miles to a horse ranch on the left. North across the road from the ranch is a dirt road. Turn right onto this road, go through the gate and go 2.15 miles to a fork. Bear right and proceed 0.4 miles to an intersection. Continue straight for 0.25 miles to a faint turnoff on the right. Turn right and drive across the meadow toward Middle Spring. Go 0.2 miles to the base of the hill just before Middle Spring. Walk to the highest point on the hill. There is a rock monument on top. From the monument, the 0-foot baseline stake is 12 paces away bearing 90°M.





Map Name: Dry Fork Diagrammatic Sketch

Township 3S , Range 20E , Section 3 UTM 4493391.447 N, 612469.698 E

DISCUSSION

Trend Study No. 9-3 (11-4)

The Dry Fork Mountain study is on Dry Fork Mountain near Middle Spring at an elevation of 7,800 feet. The area is a sagebrush-grass type and is administered by the BLM. The site has an average slope of 13% and a southeast aspect. The sagebrush slopes on the south face of Dry Fork Mountain provide important big game winter range. This area is grazed from June 1 to September 15 (470 AUM's). A pellet group transect read along the baseline in 2000 estimates moderate use of the site by deer with 68 deer days use/acre (167 ddu/ha). Use by elk is light with 3 elk days use/acre (8 edu/ha). Cattle use was also light with 7 cow days use/acre (16 cdu/ha) estimated when the site was read in mid-July 2000.

The soil is a coarse sandy loam that is shallow, rocky, and well drained. Estimated effective rooting depth is just over 7 inches and average soil temperature is moderately high for this elevation at nearly 72° F. A stoniness profile index shows nearly 80% of the penetrometer readings to be within the upper 4 inches of the soil profile. Soil reactivity is slightly acidic (pH of 6.1). Erosion and soil movement are minimal due to the excellent and well dispersed vegetation and litter cover.

Key browse for the site are mountain big sagebrush and antelope bitterbrush. Sagebrush accounted for 61% and 56% of the total browse cover in 1995 and 2000 respectively, while bitterbrush made up 29% and 31% of the browse cover for the same years. Sagebrush cover is currently ('00) estimated at about 22% with an estimated density of 2,720 plants/acre. Vigor is currently good and use is light to moderate. Percent decadency slightly increased from 11% in 1995 to 18% in 2000. This level is still much lower than the 42% estimated in 1988. The current level of decadence is not excessive for sagebrush especially during a period of extended drought. Recruitment is currently ('00) moderate at 7% (200 plants/acre) and fairly steady over the past three readings. Sagebrush on the site is vigorous with good leader growth and seed production.

Antelope bitterbrush is not as abundant as sagebrush, but is more preferred and shows heavier use. Bitterbrush density was estimated at 1,399 plants/acre in 1988, increasing to 1,960 in 1995, and 1,880 in 2000. During the 1988 reading, all bitterbrush sampled displayed heavy hedging. Heavy use has declined somewhat since then to 58% and 62% respectively in 1995 and 2000. Even with this heavy use, vigor remains good over all years. Percent decadency increased from 4% in 1995 to 14% in 2000. Bitterbrush on the site display a prostrate growth form, averaging only 20 inches in height. Recruitment from young plants is currently good at 14%. Annual growth on bitterbrush is minimal in 2000 averaging less than 1 inch throughout the site.

Other browse encountered on the site include: pricklypear cactus, mountain low rabbitbrush, broom snakeweed, Oregon grape, wax current and snowberry. Pricklypear is increasing over the site and is currently estimated at 6,060 plants/acre. This represents the largest negative factor facing the browse component on Dry Fork Mountain.

The herbaceous understory is dominated by perennial grasses which accounted for 28% of the total vegetation cover in 1995, increasing to 39% in 2000. Sum of nested frequency of perennial grasses remained the same between 1995 and 2000. The relatively high sagebrush cover at this site does not appear to be suppressing the understory as of yet. Needle-and-thread is by far the most abundant grass, followed by two wheatgrass species, thickspike and bluebunch. Annual cheatgrass was fairly common in 1995, being sampled in 49% of the quadrats. However, with the dry conditions in 2000, cheatgrass occurred in only 1 quadrat. Forbs are diverse but were dominated by annuals in 1995. Annual forbs were nearly non-existent in 2000 with drought. Perennial forb species decreased in sum of nested frequency. The most abundant perennial forbs are scarlet globemallow and redroot eriogonum.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable with adequate ground cover and little soil movement. Vegetative trend appears stable to declining. The preferred species, antelope bitterbrush, occurs in less than optimum numbers and does not appear to be increasing. The key species, Mountain big sagebrush, currently dominates the site. The most obvious indicator of declining trend is the apparent increase of prickly pear. Grasses are in fair to good condition, although a moderately palatable increaser (i.e. needle-and-thread) is quite abundant. Forbs are much less important and composition consists largely of scarlet globemallow.

1988 TREND ASSESSMENT

A small increase was noted in the percentage of vegetative basal cover found in 1988, but the significant changes in ground cover occurred in the loss of cryptogams, increase of rock on the soil surface, and a decline in percent bare ground. The loose soil is well protected by the dense shrub overstory and runoff is localized. Trend for soil is up slightly. The browse trend is slightly up for bitterbrush, but heavy use of this shrub should be watched closely. Mountain big sagebrush densities have also increased but so has percent decadence now at 42%. Trend for sagebrush is stable. One negative aspect of the browse trend is the large increase in pricklypear cactus. Age class analysis indicates 68% of the population consists of young plants. Trend for the herbaceous understory is up for grasses and stable for forbs.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable for sagebrush and slightly up for bitterbrush (3)
herbaceous understory - up (5)

1995 TREND ASSESSMENT

Ground cover characteristics have improved since 1988 with percent rock cover declining to near 1982 levels, along with a further decline in bare ground now at only 2%. Trend for soil is slightly up. The preferred browse species, bitterbrush, displays an upward trend with an increase in density and decline in the proportion of shrubs being heavily browsed. Percent decadence has remained low at 4%. The key browse species, mountain big sagebrush, also shows an improving trend with a decline in percent decadence and an increase in density. An additional improvement in the browse composition is the decline in prickly pear cactus. Trend for the herbaceous understory is slightly up with an increase in sum of nested frequency of perennial grasses and forbs. It appears that thickspike wheatgrass (*Agropyron dasystachyum*) was misidentified and combined with bluebunch wheatgrass in 1988.

TREND ASSESSMENT
soil - slightly up and in excellent condition (4)
browse - slightly up (4)
herbaceous understory - slightly up (4)

2000 TREND ASSESSMENT

Trend for soil is stable. Bare ground remains low and protective ground cover from vegetation and litter are abundant and well dispersed. Erosion is minimal as a result. Trend for browse is stable. Bitterbrush increased in decadency, but vigor remains good while use has remained about the same as the 1995 level. Recruitment is also good at 14%. Mountain big sagebrush also increased in decadency (11% to 18%), but this level is not excessive for sagebrush. Vigor remains mostly good and use is mostly light. Annual leader growth and seed production are both good for sagebrush and recruitment is adequate at 7%. The increase in pricklypear cactus is

the main negative factor for the browse component at this site. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses stayed the same, while perennial forbs slightly decreased due to drought. However, the forbs only contribute to about 1% total cover.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 3

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a-	b73	b97	57	-	26	36	1.35	2.73
G	Agropyron spicatum	c212	b86	a36	2	72	29	15	3.33	1.73
G	Bromus tectorum (a)	-	b138	a1	-	-	49	1	2.91	.00
G	Carex spp.	6	17	16	3	3	7	6	.37	.48
G	Oryzopsis hymenoides	1	5	-	-	1	2	-	.06	-
G	Poa fendleriana	ab9	a8	b30	1	5	3	12	.16	.43
G	Poa pratensis	a-	b7	c60	-	-	4	17	.31	5.63
G	Sitanion hystrix	b55	ab36	a22	5	24	16	8	.21	.34
G	Stipa comata	a121	b234	b207	54	47	78	67	11.03	14.64
G	Stipa lettermani	-	6	4	-	-	2	1	.06	.15
G	Unknown grass - perennial	b10	a-	a-	-	3	-	-	-	-
Total for Annual Grasses		0	138	1	0	0	49	1	2.91	0.00
Total for Perennial Grasses		414	472	472	122	155	167	162	16.90	26.15
Total for Grasses		414	610	473	122	155	216	163	19.81	26.15
F	Antennaria rosea	-	-	-	1	-	-	-	-	-
F	Arabis spp.	-	3	-	-	-	2	-	.01	-
F	Arenaria congesta	-	-	-	1	-	-	-	-	-
F	Astragalus convallarius	a-	b9	b7	-	-	4	3	.02	.06
F	Calochortus nuttallii	b8	b9	a-	1	4	4	-	.02	-
F	Collomia linearis (a)	-	b152	a5	-	-	57	3	1.64	.01
F	Collinsia parviflora (a)	-	b58	a6	-	-	27	3	.33	.01
F	Cryptantha spp.	3	9	2	-	2	4	1	.07	.03
F	Cymopterus longipes	-	7	11	-	-	3	5	.01	.12
F	Descurainia pinnata (a)	-	1	-	-	-	1	-	.00	-
F	Eriogonum racemosum	a2	b13	ab12	1	1	6	6	.10	.15
F	Heterotheca villosa	1	-	5	2	1	-	2	-	.01

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Hymenoxys acaulis	-	1	3	-	-	1	1	.00	.15
F	Lactuca serriola	-	3	-	-	-	1	-	.00	-
F	Lepidium spp. (a)	-	2	-	-	-	2	-	.01	-
F	Lithospermum spp.	$_{a}$-	$_{b}$6	$_{a}$-	-	-	3	-	.16	.03
F	Lupinus argenteus	$_{a}$-	$_{b}$7	$_{b}$6	-	-	4	4	.12	.24
F	Machaeranthera canescens	-	3	-	-	-	2	-	.01	-
F	Orobanche fasciculata	$_{a}$-	$_{ab}$2	$_{b}$5	-	-	1	4	.00	.07
F	Penstemon humilis	2	3	3	2	1	1	1	.03	.03
F	Phlox longifolia	-	-	1	-	-	-	1	-	.00
F	Polygonum douglasii (a)	-	$_{b}$28	$_{a}$2	-	-	13	1	.06	.00
F	Sphaeralcea coccinea	$_{a}$6	$_{b}$31	$_{a}$15	16	3	13	7	.36	.13
F	Tragopogon dubius	-	6	7	-	-	3	4	.04	.04
F	Zigadenus elegans	-	14	6	-	-	5	3	.03	.09
Total for Annual Forbs		0	241	13	0	0	100	7	2.05	0.03
Total for Perennial Forbs		22	126	83	14	12	57	42	1.02	1.18
Total for Forbs		22	367	96	14	12	157	49	3.08	1.21

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 3

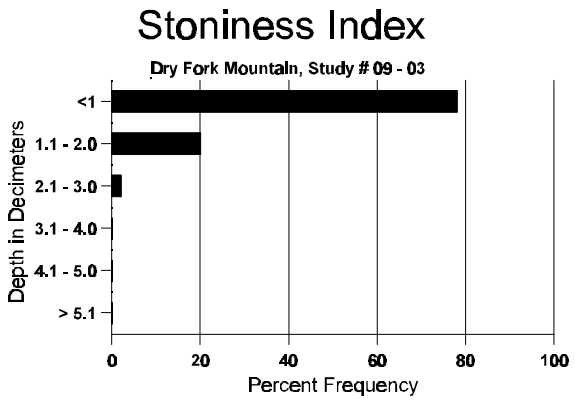
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata vaseyana	76	70	22.85	21.93
B	Chrysothamnus viscidiflorus lanceolatus	4	2	.06	.15
B	Gutierrezia sarothrae	4	1	.00	-
B	Mahonia repens	1	2	-	-
B	Opuntia fragilis	77	82	2.83	4.13
B	Pediocactus simpsonii	1	0	-	-
B	Purshia tridentata	65	71	10.91	12.03
B	Symphoricarpos oreophilus	3	3	.56	.91
Total for Browse		231	231	37.22	39.16

BASIC COVER --
Herd unit 09 , Study no: 3

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	353	347	4.00	6.50	58.21	64.25
Rock	211	179	9.50	17.00	9.85	13.81
Pavement	43	62	1.25	.50	.33	1.34
Litter	396	390	68.75	69.75	67.73	66.24
Cryptogams	7	10	4.25	0	.04	.22
Bare Ground	67	78	12.25	6.25	2.08	4.22

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 3, Study Name: Dry Fork Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
7.18	71.6 (8.27)	6.1	64.6	15.8	16.6	5.3	29.9	124.8	0.5



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 3

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	9	5	792	N/A
Elk	6	-	44	3 (8)
Deer	30	17	879	68 (167)
Cattle	2	-	78	7 (16)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 3

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	14	59	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	15	29	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	0		-
	'88	0		-
	'95	0		-
	'00	0		-

Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	88	2	1	-	-	-	-	-	-	-	3	-	-	-	200			3
	95	6	4	-	-	-	-	-	-	-	10	-	-	-	200			10
	00	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10
M	82	21	-	-	-	-	-	-	-	-	17	4	-	-	1400	27	40	21
	88	12	7	-	-	-	-	-	-	-	19	-	-	-	1266	26	31	19
	95	59	46	11	-	-	2	-	-	-	115	-	1	2	2360	30	48	118
	00	90	7	-	4	-	-	-	-	-	99	-	2	-	2020	31	44	101
D	82	4	-	-	-	-	-	-	-	-	2	2	-	-	266			4
	88	14	2	-	-	-	-	-	-	-	16	-	-	-	1066			16
	95	7	6	3	-	-	-	-	-	-	9	-	-	7	320			16
	00	17	8	-	-	-	-	-	-	-	23	-	-	2	500			25
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	500			25
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	280			14

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+32%
'88	26%	00%	00%	+12%
'95	39%	11%	07%	- 6%
'00	11%	00%	03%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	1732		15%
	'88	2532		42%
	'95	2880		11%
	'00	2720		18%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus lanceolatus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	16	20	1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	-	-	1	-	-	-	-	-	3	-	-	-	60	12	24	3
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	8	7	2
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	2	-	-	-	-	-	-	2	-	-	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+50%
'88	00%	100%	00%	-40%
'95	00%	00%	00%	-50%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	66	Dec:	0%
	'88	133		100%
	'95	80		0%
	'00	40		0%

Eriogonum heracleoides																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	6	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100	8	7	5
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	8	5	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	-20%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	100		-
	'00	80		-

Mahonia repens																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	4	9	2
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	4	4	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+50%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	40		-
	'00	80		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia fragilis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
Y	82	15	-	-	-	-	-	-	-	-	15	-	-	-	1000			15
	88	61	-	-	3	-	-	1	-	-	65	-	-	-	4333			65
	95	12	-	-	-	-	-	-	-	-	12	-	-	-	240			12
	00	12	-	-	-	-	-	1	-	-	13	-	-	-	260			13
M	82	39	-	-	-	-	-	-	-	-	39	-	-	-	2600	4	10	39
	88	28	-	-	1	-	-	1	-	-	30	-	-	-	2000	5	12	30
	95	207	-	-	14	-	-	-	-	-	215	-	6	-	4420	5	15	221
	00	279	-	-	2	-	-	3	-	-	284	-	-	-	5680	4	11	284
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	-	-	1	-	20			1
	00	5	-	-	-	-	-	1	-	-	4	-	-	2	120			6
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	120			6
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+43%
'88	00%	00%	00%	-26%
'95	00%	00%	03%	+23%
'00	00%	00%	.66%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	3600	Dec:	0%
	'88	6333		0%
	'95	4680		0%
	'00	6060		2%

Pediocactus simpsonii																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	4	4	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	20		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	5	1	-	4	1	-	-	-	13	-	-	-	260			13
	00	9	2	-	-	-	-	2	-	-	13	-	-	-	260			13
M	82	12	-	-	-	-	-	-	-	-	8	4	-	-	800	20	36	12
	88	-	-	19	-	-	1	-	-	-	20	-	-	-	1333	15	25	20
	95	7	18	33	1	3	19	-	-	-	81	-	-	-	1620	18	46	81
	00	9	2	15	-	7	28	1	-	6	66	2	-	-	1360	20	50	68
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	1	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	2	-	1	1	-	-	-	3	-	-	1	80			4
	00	1	-	3	-	2	4	1	-	2	11	-	-	2	260			13
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+43%
'88	00%	100%	00%	+29%
'95	32%	58%	01%	- 4%
'00	14%	62%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	800	Dec:		0%
'88	1399			5%
'95	1960			4%
'00	1880			14%

Ribes cereum cereum																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	45	67	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	0	Dec:	-
'88	0		-
'95	0		-
'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	1	-	-	-	-	-	-	-	1	-	-	-	66	13	9	1
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	14	27	3
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	12	31	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	100%	00%	00%	- 9%
'95	00%	00%	00%	+25%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	66		-
	'95	60		-
	'00	80		-

Trend Study 9-4-00

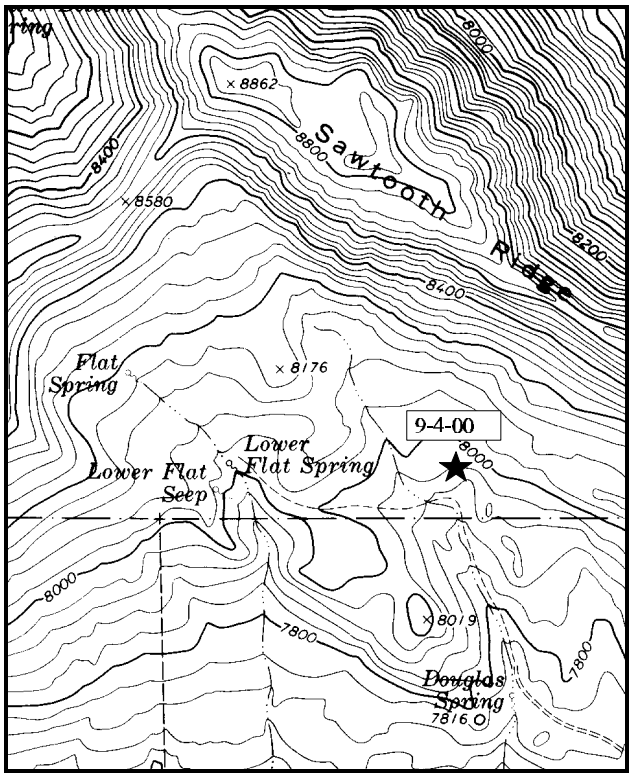
Study site name: Sawtooth-Flat Spring . Range type: Sagebrush-Bitterbrush .

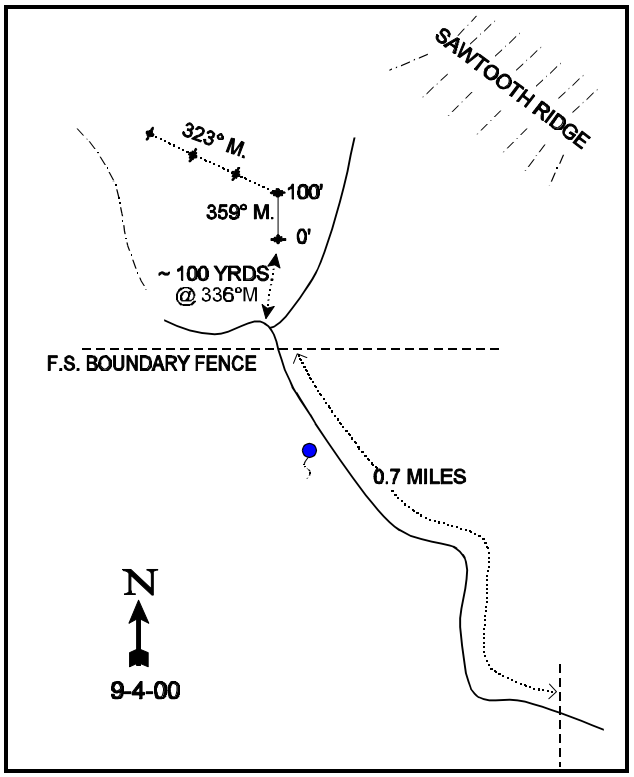
Compass bearing: frequency baseline 359°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (13 & 92ft), line 2 (40ft), line 3 (52ft), line 4 (71ft).

LOCATION DESCRIPTION

From Lapoint, drive east then turn north just before the bridge over Deep Creek. Proceed north for 6.85 miles to a fork. Bear right towards Deep Creek Ranch. Stay on this road for 9.8 miles to a dirt road on the left heading north up Pine Ridge. This road can also be reached by driving 3 miles west from Dry Fork. The gate may be locked. Turn left and drive 1.65 miles to a cattle guard. Continue 1.1 miles to a gate. Go through the gate and 0.7 miles to the fence on the FS boundary. Go through the gate and stop. From the yellow fencepost near the gate, walk 63 paces north bearing 336°M to the 0-foot baseline stake.





Map Name: Lake Mountain

Diagrammatic Sketch

Township 2S , Range l9E , Section 35

UTM 4494140.237 N, 605104.509 E

DISCUSSION

Trend Study No. 9-4 (11-5)

The Sawtooth-Flat Spring trend study is located on the south side of Sawtooth Ridge, east of Lows Flat Spring. Elevation is 7,960 feet with a southeast aspect and 16% slope. The study site is just outside the 1978-79 Flat Springs prescribed burn. The study samples a mountain big sagebrush/grass type with an important bitterbrush component. Quadrat frequency of deer pellet groups was moderately high in 1995 at 32%, while elk were only 6%. Rabbit pellet group quadrat frequency was quite high at 45%. A pellet group transect was read along the study baseline in 2000 estimates 75 deer days use/acre (185 ddu/ha), 25 elk days use/acre (63 edu/ha), and 16 cow days use/acre (40 cdu/ha). This study is in the Lake Mountain allotment which is grazed from June 21 to September 30 by 276 cows and calves on a 4-unit rest-rotation system.

Soils are sandy loam in texture and very rocky. Estimated effective rooting depth is just over 9 inches, while penetrometer readings show the majority of rock to be in the upper 8 inches of the profile. However, the presence of mountain big sagebrush suggests that the soil is deeper and effective soil depth measurements are limited by the rocky nature of the soil profile. The soil is slightly acidic (pH of 6.1) and relatively high in organic matter (4.3%). Vegetation and litter cover are high and well dispersed, preventing most soil erosion problems.

Key browse on the site consist of antelope bitterbrush and mountain big sagebrush. Sagebrush is more numerous and currently (‘00) provides 78% of the browse cover. It has an estimated density of 2,740 plants/acre in 2000. Vigor has generally been good on sagebrush with 8% of the population displaying poor vigor in 2000. In 1995, 56% of the population was classified as being moderately browsed. In 2000, use was mostly light, with less than 5% of the population showing moderate or heavy use. Percent decadency has varied with each reading, with the highest level occurring in 1988 at 37%. Percent decadency is currently (‘00) at 23%, a slight increase from 14% in 1995. Young recruitment is currently good at 9% and biotic potential (number of seedlings) is high at 22%. In 2000, seed production was noted as being high for the past few years. Annual growth averaged about 3 inches.

Antelope bitterbrush is the most preferred browse species on the site. Bitterbrush currently (‘00) provides 16% of the browse cover and has an estimated density of 1,520 plants/acre. Density has varied slightly in each sampling year. However, the number of mature plants has remained relatively stable. Use has been classified as moderate to heavy during all readings. In 1982, thirty-eight percent of the mature plants displayed heavy hedging, increasing to 79% by 1988. Heavy use decreased in 1995 to 48% of the population, then slightly increasing to 62% in 2000. Vigor is mostly good with only 8% of the population showing poor vigor in 2000. Percent decadency steadily increased between 1982 and 1995 from 0% to 22%. Currently (‘00), percent decadency is 11% and recruitment from young plants is moderately high at 14% (220 plants/acre). The bitterbrush population displays a prostrate growth form. Mature plants averaged only 14 inches in height with a 32 inch crown in 2000. Annual growth averages about 5 inches in 2000, with low seed production being noted.

Other browse are infrequent, but include: snowberry, mountain low rabbitbrush and a few scattered serviceberry.

Grasses and forbs are diverse, dense, and provide over 70% of the total vegetative cover in both 1995 and 2000. At the time of the 1988 reading, grass utilization was light, but cattle had just come onto the site. Due to recent seed head removal that year, species identification was difficult for some grasses. Currently (‘00), needle-and-thread and the increaser, Kentucky bluegrass, are the most abundant species in both cover and nested frequency. Muttongrass was also abundant in 1995 and 2000. As a group, perennial grasses decreased in sum of nested frequency by 13% in 2000. This decrease is most likely due to drought. This condition should improve with a

return to normal precipitation. In 2000, grasses had not been utilized when the site was read in July. There are numerous valuable forb species found on the site, especially arrowleaf balsamroot and silver lupine which accounted for 74% of the forb cover in 1995 and 90% in 2000. Forbs were far less abundant in 2000 due to drought, with perennial sum of nested frequency decreasing by 35%. Annual forbs, which were moderately abundant in 1995, were almost non-existent with the drought in 2000. As with grasses, perennial forbs should increase with a return to normal precipitation in the future.

1982 APPARENT TREND ASSESSMENT

Range condition is good and overall trend appears stable. There is little compelling evidence for either extensive soil loss or vegetational change. The area appears capable of supporting more big game animals if livestock use remains at the current level.

1988 TREND ASSESSMENT

Due to the dense herbaceous understory, ground cover is excellent. Basal vegetative cover increased significantly. Percent bare ground declined slightly and there was very little detectable soil movement. Trend for soil is slightly up. The browse trend is up for mountain big sagebrush due to a large increase in density, adequate reproductive potential, a good number of young plants, good vigor, and light to moderate use. Trend for the more preferred antelope bitterbrush is also slightly up. Vigor is good and there are an adequate number of young plants. Density of mature plants increased slightly but heavy use increased to 79% of the plants sampled. Percent decadency rose from 0% to 18%, but the population appears to be in good condition in spite of the increases in use and decadency. Quadrat frequency of grasses and forbs increased since 1982, indicating a slightly upward trend for the herbaceous understory.

TREND ASSESSMENT
soil - slightly up (4)
browse - slightly up; up for sagebrush and slightly up for bitterbrush (4)
herbaceous understory - slightly up (4)

1995 TREND ASSESSMENT

Percent bare ground has declined by 48% since 1988, indicating a continued improvement in the soil trend. Litter also declined 14%, a common occurrence during this continuing drought. However, nested frequency of litter is very high indicating well dispersed protective cover. Herbaceous vegetation is also abundant accounting for 73% of the vegetative cover on the site, effectively limiting erosion. Trend for soil is slightly up. Trend for browse is stable. Mountain big sagebrush declined in density, but most of this is probably due to the increased sample size giving a better estimate of the actual population size. Reproductive potential is low, but stable, and recruitment from young plants is good at 10%. Percent decadency declined from 37% to 14%, and the young age class appears adequate to replace the decadent, dying individuals in the population. Bitterbrush continues to be heavily used yet appears to be stable. Currently, 48% of the shrubs are heavily hedged (>60% of twigs browsed). Percent decadence has increased to 22%, with 42% (160 plants/acre) of these decadent shrubs classified as dying. Average height measurements of mature plants have declined somewhat since 1982. Recruitment from young bitterbrush plants is good at 10%. Bitterbrush can withstand heavy use for long periods of time, but future trends should be watched closely with the continued drought. Trend for grasses and forbs is stable. Some of the fluctuations in the nested frequency numbers of the *Poa* grasses is the result of identification problems in 1988 and not necessarily actual changes in composition.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable (3)
herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is stable. Erosion remains minimal as vegetation and litter cover remain high and well disbursed over the site. Bare ground remains low and even with drought, only increased to 7%. Trend for browse is stable for both mountain big sagebrush and bitterbrush. Sagebrush shows increased density and lighter use compared to 1995 estimates. Currently, recruitment is adequate even with an increase in decadency from 14% to 23%. Bitterbrush remains at a stable density, has good recruitment, and vigor remains mostly good even with increased heavy use and drought in 2000. Percent decadency also decreased from 22% to 11%. Trend for the herbaceous understory is slightly down due to drought. Perennial grass sum of nested frequency decreased by 13%, with perennial forb sum of nested frequency decreasing by 35%. Normal precipitation patterns in the future should reverse this decline.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 4

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	$_{a}$59	$_{b}$116	$_{a}$70	14	32	45	30	1.42	.69
G	Carex spp.	$_{b}$85	$_{a}$22	$_{a}$49	15	38	10	18	.24	2.16
G	Koeleria cristata	$_{b}$23	$_{a}$-	$_{a}$5	33	9	-	2	.00	.06
G	Poa fendleriana	$_{b}$315	$_{a}$131	$_{a}$135	61	97	50	54	3.02	4.46
G	Poa pratensis	$_{a}$81	$_{b}$138	$_{b}$165	4	30	44	49	7.83	9.85
G	Poa secunda	$_{b}$29	$_{a}$14	$_{a}$3	9	11	4	1	.09	.00
G	Sitanion hystrix	$_{b}$10	$_{ab}$5	$_{a}$1	-	6	2	1	.03	.03
G	Stipa comata	$_{a}$45	$_{b}$168	$_{c}$193	29	24	60	66	5.97	12.59
G	Stipa lettermani	$_{b}$83	$_{ab}$140	$_{a}$14	37	36	48	6	4.17	.49
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		730	734	635	202	283	263	227	22.81	30.35
Total for Grasses		730	734	635	202	283	263	227	22.81	30.35
F	Agoseris glauca	3	7	11	-	3	4	4	.02	.07
F	Allium spp.	$_{a}$2	$_{ab}$118	$_{b}$28	28	1	52	12	.36	.19
F	Antennaria rosea	5	13	1	2	2	6	1	.30	.03
F	Arabis spp.	$_{b}$51	$_{a}$6	$_{a}$7	1	23	3	3	.01	.04

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Artemisia ludoviciana	-	-	4	-	-	-	1	-	.03
F	Astragalus spp.	$_{b}$4	$_{b}$6	$_{a}$-	-	3	2	-	.01	-
F	Balsamorhiza sagittata	152	160	148	50	70	68	63	14.00	15.28
F	Castilleja linariaefolia	-	4	2	-	-	2	2	.01	.03
F	Calochortus nuttallii	-	2	-	5	-	2	-	.01	-
F	Chenopodium spp. (a)	-	$_{b}$15	$_{a}$-	-	-	7	-	.03	-
F	Collomia linearis (a)	-	$_{b}$264	$_{a}$24	-	-	93	12	2.08	.08
F	Comandra pallida	$_{a}$-	$_{ab}$3	$_{b}$7	-	-	2	4	.01	.09
F	Collinsia parviflora (a)	-	$_{b}$173	$_{a}$18	-	-	65	10	1.33	.05
F	Crepis acuminata	$_{a}$2	$_{b}$21	$_{a}$1	3	1	9	1	.45	.00
F	Cryptantha spp.	-	2	-	-	-	1	-	.00	-
F	Descurainia pinnata (a)	-	$_{b}$13	$_{a}$-	-	-	5	-	.07	-
F	Eriogonum alatum	4	-	-	-	2	-	-	-	-
F	Erigeron eatonii	$_{b}$6	$_{a}$-	$_{b}$4	5	3	-	3	-	.01
F	Erigeron flagellaris	8	1	5	6	3	1	2	.00	.06
F	Eriogonum racemosum	9	7	16	8	7	3	7	.09	.28
F	Eriogonum umbellatum	$_{a}$1	$_{b}$14	$_{b}$13	3	1	7	8	.30	.14
F	Heterotheca villosa	-	-	2	-	-	-	1	-	.03
F	Lomatium spp.	18	11	5	3	7	6	3	.03	.06
F	Lupinus argenteus	$_{a}$55	$_{b}$91	$_{ab}$77	36	30	44	41	3.35	2.72
F	Lychnis drummondii	$_{ab}$6	$_{b}$13	$_{a}$1	15	3	8	1	.09	.00
F	Orobanche fasciculata	$_{a}$-	$_{b}$8	$_{ab}$3	-	-	4	2	.02	.03
F	Penstemon humilis	52	34	20	13	24	15	12	.17	.31
F	Phlox longifolia	$_{b}$96	$_{a}$43	$_{a}$20	1	48	20	9	.20	.07
F	Polygonum douglasii (a)	-	$_{b}$76	$_{a}$11	8	-	35	4	.22	.02
F	Potentilla gracilis	-	3	3	-	-	2	1	.03	.00
F	Senecio integerrimus	-	2	2	-	-	1	2	.15	.03
F	Sedum lanceolatum	-	1	-	-	-	1	-	.00	-
F	Senecio multilobatus	1	2	1	3	1	1	1	.03	.00
F	Tragopogon dubius	$_{b}$7	$_{b}$7	$_{a}$-	-	3	3	-	.01	-
F	Unknown forb-perennial	$_{b}$5	$_{a}$-	$_{a}$-	-	3	-	-	-	-
F	Zigadenus elegans	-	4	1	3	-	2	1	.01	.03
Total for Annual Forbs		0	541	53	8	0	205	26	3.76	0.15
Total for Perennial Forbs		487	583	382	185	238	269	185	19.71	19.58
Total for Forbs		487	1124	435	193	238	474	211	23.47	19.73

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 4

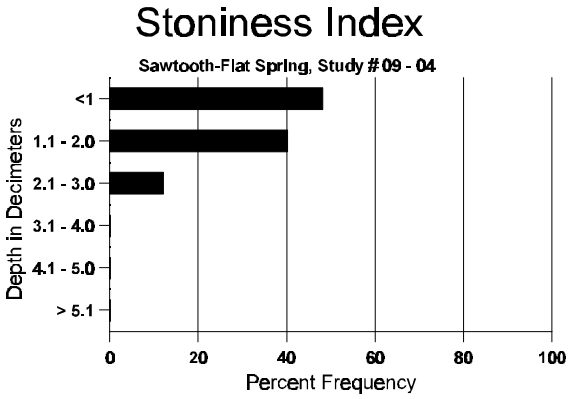
Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Amelanchier alnifolia	0	1	-	-
B	Artemisia tridentata vaseyana	72	78	12.34	15.40
B	Chrysothamnus viscidiflorus lanceolatus	5	4	.30	.36
B	Eriogonum heracleoides	3	7	.06	.30
B	Mahonia repens	2	2	.00	.03
B	Opuntia fragilis	3	2	.01	.00
B	Pediocactus simpsonii	1	0	.03	-
B	Purshia tridentata	52	54	3.87	3.12
B	Symphoricarpos oreophilus	11	12	.30	.52
Total for Browse		149	160	16.93	19.73

BASIC COVER --
Herd unit 09 , Study no: 4

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '82	Average Cover % '88	Average Cover % '95	Average Cover % '00
Vegetation	375	368	7.25	12.50	61.72	64.45
Rock	111	65	1.75	1.50	2.08	1.64
Pavement	84	112	0	2.00	1.07	1.77
Litter	392	394	67.75	73.25	63.34	65.68
Cryptogams	-	18	.75	0	0	.42
Bare Ground	157	146	22.50	10.75	5.61	7.58

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 4, Study Name: Sawtooth-Flat Spring

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.24	58.2 (10.71)	6.1	67.4	18.4	14.3	4.3	28.2	236.8	0.7



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 4

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	5	4	209	N/A
Elk	5	8	331	25 (63)
Deer	31	30	974	75 (185)
Cattle	9	1	191	16 (39)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 4

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	1	-	1	-	-	-	-	-	2	-	-	-	133			2
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	28	-	-	-	-	-	2	-	-	30	-	-	-	600			30
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	88	5	4	-	-	-	-	-	-	-	9	-	-	-	600			9
	95	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10
	00	10	-	-	-	-	-	3	-	-	13	-	-	-	260			13
M	82	18	-	-	-	-	-	-	-	-	18	-	-	-	1200	26	30	18
	88	21	7	-	-	-	-	-	-	-	28	-	-	-	1866	22	20	28
	95	30	46	2	-	-	-	-	-	-	78	-	-	-	1560	27	43	78
	00	85	1	1	5	-	-	-	-	-	91	-	1	-	1840	28	39	92
D	82	3	-	-	-	-	-	-	-	-	1	2	-	-	200			3
	88	9	9	3	1	-	-	-	-	-	21	-	1	-	1466			22
	95	1	11	2	-	-	-	-	-	-	10	-	-	4	280			14
	00	22	4	-	6	-	-	-	-	-	22	-	-	10	640			32
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	240			12

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+63%
'88	34%	05%	02%	-48%
'95	56%	04%	04%	+26%
'00	04%	.72%	08%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	1466	Dec:		14%
'88	3932			37%
'95	2040			14%
'00	2740			23%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus lanceolatus																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	6	-	-	-	-	-	-	-	-	6	-	-	-	120	14	28	6
	00	6	-	-	-	-	-	-	-	-	6	-	-	-	120	15	24	6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+ 0%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	0	Dec:		-
'88	0			-
'95	120			-
'00	120			-

Eriogonum heracleoides																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	10	13	3
	00	8	-	-	1	-	-	2	-	-	11	-	-	-	220	4	6	11

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+45%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	0	Dec:	-
'88	0		-
'95	120		-
'00	220		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Mahonia repens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	00	1	-	-	-	-	-	2	-	-	3	-	-	-	60			3
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	5	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	4	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	-25%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	80		-
	'00	60		-

Opuntia fragilis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	4	-	-	1	-	-	1	-	-	5	-	1	-	400			6
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	1	-	-	-	-	-	1	-	-	-	66	5	4	1
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	2	5	3
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	2	5	4
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	3	-	-	1	-	-	-	-	-	3	-	1	-	266			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	18%	-89%
'95	00%	00%	00%	+ 0%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	0%
	'88	732		36%
	'95	80		0%
	'00	80		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pediocactus simpsonii																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	3	4	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	20		-
	'00	0		-

Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	4	-	-	-	-	-	-	-	4	-	-	-	266			4
	95	6	1	1	1	-	-	-	-	-	9	-	-	-	180			9
	00	6	4	-	1	-	-	-	-	-	11	-	-	-	220			11
M	82	3	7	6	-	-	-	-	-	-	10	6	-	-	1066	19	28	16
	88	-	-	18	-	1	-	-	-	-	19	-	-	-	1266	17	28	19
	95	3	19	7	3	4	22	-	-	-	58	-	-	-	1160	13	32	58
	00	8	4	9	2	-	28	1	-	5	57	-	-	-	1140	14	32	57
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	1	4	-	-	-	-	-	-	5	-	-	-	333			5
	95	-	4	5	1	-	6	3	-	-	11	-	-	8	380			19
	00	1	-	1	-	2	4	-	-	-	2	-	-	6	160			8
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	44%	38%	00%	+43%
'88	21%	79%	00%	- 8%
'95	33%	48%	09%	-12%
'00	13%	62%	08%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	1066	Dec:	0%
	'88	1865		18%
	'95	1720		22%
	'00	1520		11%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	88	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	2	1	-	1	-	-	-	-	-	4	-	-	-	266	18	18	4
	95	3	10	-	4	-	-	-	-	-	17	-	-	-	340	19	38	17
	00	8	-	-	2	-	-	-	-	-	10	-	-	-	200	19	50	10
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	1	-	-	1	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+20%
'88	40%	00%	00%	+28%
'95	43%	00%	00%	-43%
'00	00%	00%	08%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	266	Dec:	0%
	'88	332		0%
	'95	460		0%
	'00	260		15%

Trend Study 9-5-00

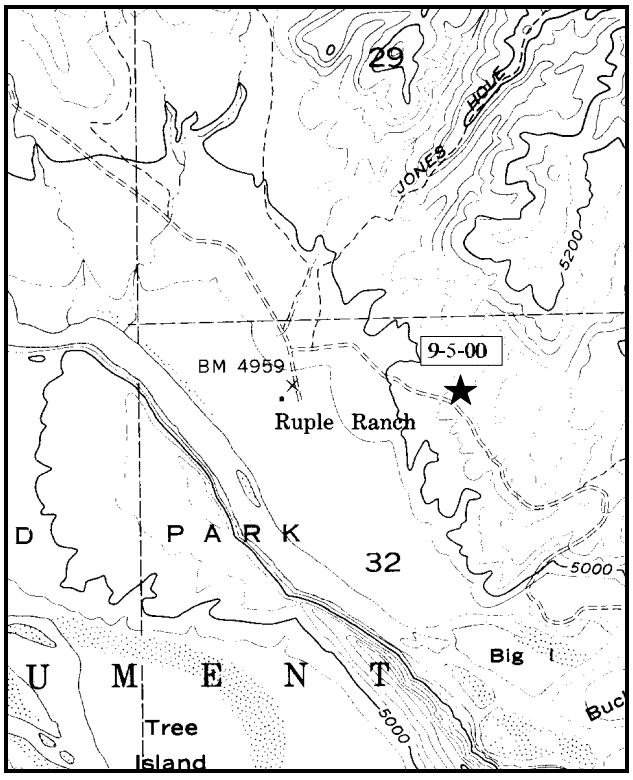
Study site name: Island Park . Range type: Big Sagebrush-Grass .

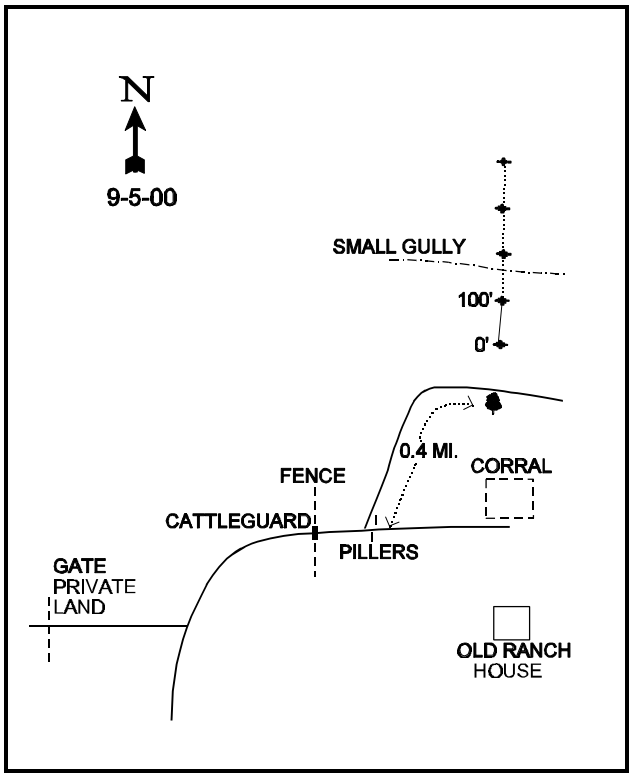
Compass bearing: frequency baseline 12°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (9 & 88ft), line 2 (26ft), line 3 (48ft), line 4 (73ft).

LOCATION DESCRIPTION

From the Diamond Mountain Road, take the Island Park turnoff to the right. Proceed east for 2.1 miles to a fork. Stay to the left and go 17.7 miles. Just past the Jones Hole trailhead and before Ruple Ranch, there is a turnoff to the left. The road may be closed. Go left and proceed up the ridge for 0.4 miles to a juniper next to the road on the right. From the juniper, the 0-foot baseline stake is 20 paces away at a bearing of 28°M.





Map Name: Island Park Diagrammatic Sketch

Township 3S , Range 25E , Section 32 UTM 4487260 N, 658118 E

DISCUSSION

Trend Study No. 9-5 (11-6)

The Island Park study is located on a sagebrush-grass slope one-half mile above the Green River in Dinosaur National Monument. This site is on deer winter range at an elevation of approximately 5,000 feet and a slope of about 25%. Aspect is south, southwest. Deer and rabbit pellets had high quadrat frequencies in 1995, while elk were low. Quadrat frequency decreased for deer and rabbit pellets in 2000, but increased for elk. A pellet group transect read along the baseline in 2000 estimates 47 deer days use/acre (116 ddu/ha) and 57 elk days use/acre (141 edu/ha). Livestock grazing is no longer permitted as this site is found within the national monument.

Soils are a sandy loam with little surface rock. Estimated effective rooting depth is nearly 13 inches and average soil temperature is relatively high at over 73°F. Soil temperatures this high often indicate the potential for annual weed invasion, primarily from winter annuals such as cheatgrass. Soil movement is noticeable, which is currently ('00) described as being moderate. Interspaces between shrubs are generally devoid of vegetation except for the small annual grasses, sixweeks fescue and cheatgrass. Cryptogamic crusts have slowly increased since 1982 with no grazing. They provide added protection to the soil. With drought in 2000, bare ground increased from 31% to nearly 45%.

In 1982, the key browse species was identified as Wyoming big sagebrush. At that time it was in fair to poor condition and moderately hedged. Thirty percent of the stand displayed poor vigor and percent decadency was relatively high for a Wyoming big sagebrush site at 44%. The 1988 survey found a more decadent stand of sagebrush (29% mature, 51% decadent) with moderate to heavy hedging, poor growth, and low seed production. In 1995, percent decadency declined to 39%, with 71% (920 plants/acre) of these decadent plants being classified as dying. Also, nearly 80% of the population displayed moderate or heavy hedging. Those classified with poor vigor increased to 29% of the population. The number of dead plants/acre in 1995, indicated that 1 of almost every 3 plants (1,520 plants/acre) were dead. In 2000, the condition of sagebrush continued to decline. Percent decadency has drastically increased to 82%, half of the population is classified with poor vigor, while use remains at a moderate to high level. Sixty-one percent of the decadent plants were classified as dying in 2000, representing 1,390 plants/acre that could be lost from the population if conditions persist. Young recruitment is low (80 plants/acre) and not adequate to replace individuals lost to a die-off. Extended drought, inter and intraspecific competition appear to be the most negatively influencing factors to this sagebrush stand. Leader growth on sagebrush is currently ('00) poor, averaging 1-2 inches. It appears that the sagebrush on this site has some characteristics of both basin big sagebrush (*Artemisia tridentata tridentata)* and Wyoming big sagebrush (*A. tridentata wyomingensis*), indicating hybridization between the two subspecies.

Another sign of possible declining range condition, first noted in 1982, was the abundance of broom snakeweed which appeared to have an expanding population. In 1995, snakeweed was estimated at 3,580 plants/acre with high recruitment (36%) and mostly good vigor. In 2000, snakeweed has increased exponentially to an estimated 30,120 plants/acre. Snakeweed often declines with drought, but with this large of a population, the drought conditions in 2000 appear to have not yet negatively impacted this species. The population appears stable with 92% of the population being mature. Other shrubs encountered on the site include: slenderbush eriogonum, pricklypear cactus and small numbers of prickly phlox.

The understory is dominated by needle-and-thread grass which made up 68% of the herbaceous cover in both 1995 and 2000. It currently ('00) provides 28% of the total vegetation cover. Thickspike wheatgrass is the only other perennial grass that is somewhat abundant. It was sampled in 19 quadrats (19% quadrat frequency) in 2000. Two annual grasses, sixweeks fescue and cheatgrass, are present on the site. Sixweeks fescue was more abundant of the two in 1995, but due to drought in 2000, was much less abundant compared to 1995 estimates.

Cheatgrass increased in nested frequency in 2000. It is presently found in about one-third of the quadrats. Forbs are depleted and dominated by annuals and provide little useful forage. All forbs, both annual and perennial species, drastically decreased in sum of nested frequency in 2000. Although, even at its best, the forbs together only provided just over 1% cover. This site is now best described as a decadent Wyoming big sagebrush community with a depleted understory.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable to declining. The estimates for ground cover show approximately 51% bare ground and less than 3% basal vegetative cover. There is active sheet and gully erosion underway and considerable quantities of soil and litter have piled up against small obstructions. Vegetative trend appears to be declining. The best evidence would appear to be an aggressive and expanding population of snakeweed and the fair to poor condition of the key browse species, Wyoming big sagebrush. In addition, understory composition is less than desirable and produces little quality forage. Furthermore, grass and forb density is inadequate to prevent or seriously impede soil movement.

1988 TREND ASSESSMENT

Percent litter cover has declined resulting in an increase in the amount of exposed bare soil, from 50% to 60%. Consequently, there is evidence of some soil loss and sedimentation. Trend for soil is slightly down. Trend for the key browse, Wyoming big sagebrush is also slightly down. Even though total population increased, the number of mature plants declined from 2,000 plants/acre to 1,666. The increase in population came primarily from the increase in decadent plants (1,666 to 2,866) which account for 51% of the population. Heavy use was also higher with 34% of the sagebrush displaying heavy hedging. Another negative factor is the abundance of broom snakeweed which increased since 1982. The herbaceous trend is up especially for grasses. Quadrat frequency of grasses doubled since 1982. Composition is dominated by needle-and-thread grass. Forbs are depleted and provide little useful forage.

TREND ASSESSMENT
soil - slightly down and poor condition (2)
browse - slightly down due to heavy use and increased decadence (2)
herbaceous understory - up for grasses, but forbs are scarce (5)

1995 TREND ASSESSMENT

Trend for soil is slightly up due to a large increase in cryptogamic crusts (5% to 11%) and an obvious increase in vegetation cover noted in the data and photos. Aerial cover instead of basal cover was estimated in 1995. Percent bare ground decreased from nearly 60% to 31%. Vegetation and litter also have high nested frequencies values indicating well dispersed cover. The spring of 1995 was unusually wet and may be partly responsible for the dramatic change in some of these ground cover values. Browse trend continues to decline due to continued moderate to heavy use, high decadence, poor vigor, declining population density, and continuing drought. The herbaceous trend is slightly up with increases in sum of nested frequency of perennial grasses and forbs.

TREND ASSESSMENT
soil - slightly up, still poor condition (4)
browse - continues down (1)
herbaceous understory - slightly up, but still poor for forbs (4)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground increased and erosion is considered moderate at this time. The abundance of herbaceous vegetation, especially perennial species, decreased in 2000 due to continuing drought. Herbaceous vegetation is key to holding soils in place. Trend for browse is down. Wyoming big sagebrush increased in decadency from 39% to 82%. Half of the sagebrush population is classified with poor vigor. Recruitment is currently low (80 plants/acre) and not adequate to replace the decadent individuals classified as dying (1,380 plants/acre). Over the past 18 years, young plants have averaged 11% of the population, while dead plants account for 31% of the population. Thus in the long term, the dead within the population are not being replaced. Furthermore, broom snakeweed exploded in density from 3,580 plants/acre to an estimated 30,120 plants/acre. Trend for the herbaceous understory is down. Sum of nested frequency of perennial grasses and forbs declined by nearly half due to continuing drought.

TREND ASSESSMENT
soil - slightly down (2)
browse - down (1)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	62	38	43	-	26	16	19	.10	1.42
G	Agropyron spicatum	-	4	4	-	-	1	2	.03	.18
G	Bromus tectorum (a)	-	a40	b97	-	-	22	35	.16	1.48
G	Hilaria jamesii	25	43	21	17	11	17	8	.50	.24
G	Oryzopsis hymenoides	12	6	11	5	6	3	4	.39	.62
G	Poa fendleriana	a-	b5	a-	-	-	3	-	.06	-
G	Poa secunda	2	4	7	2	1	2	3	.01	.01
G	Sitanion hystrix	b31	b36	a4	8	17	18	1	.24	.15
G	Stipa comata	a213	b285	a217	44	88	96	84	12.38	9.53
G	Vulpia octoflora (a)	-	b324	a5	-	-	98	3	2.97	.06
Total for Annual Grasses		0	364	102	0	0	120	38	3.13	1.55
Total for Perennial Grasses		345	421	307	76	149	156	121	13.73	12.16
Total for Grasses		345	785	409	76	149	276	159	16.86	13.71
F	Allium spp.	a9	b130	a1	9	6	64	1	.42	.00
F	Astragalus convallarius	8	18	5	3	6	8	2	.12	.01
F	Astragalus purshii	a-	b3	a-	-	-	3	-	.01	-
F	Castilleja chromosa	-	3	4	-	-	1	2	.03	.03
F	Calochortus nuttallii	a-	ab3	b6	1	-	2	3	.01	.01
F	Chenopodium leptophyllum (a)	-	1	-	-	-	1	-	.00	-
F	Descurainia pinnata (a)	a1	b57	a-	-	1	25	-	.12	-
F	Draba spp. (a)	-	b35	a-	-	-	12	-	.06	-
F	Erigeron spp.	-	3	5	-	-	1	2	.00	.01

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Euphorbia robusta	-	3	-	-	-	1	-	.03	-
F	Ipomopsis congesta	$_{a}$-	$_{b}$8	$_{a}$-	-	-	4	-	.02	-
F	Lepidium spp. (a)	-	$_{b}$24	$_{a}$-	-	-	13	-	.09	-
F	Lesquerella spp.	1	1	-	-	1	1	-	.00	-
F	Lygodesmia spp.	-	3	-	-	-	2	-	.01	-
F	Machaeranthera grindelioides	3	-	-	-	1	-	-	-	-
F	Phlox longifolia	$_{b}$72	$_{a}$23	$_{a}$22	-	35	11	10	.05	.15
F	Plantago patagonica (a)	-	$_{b}$16	$_{a}$-	-	-	6	-	.05	-
F	Polygonum douglasii (a)	-	3	4	-	-	1	2	.00	.01
F	Sisymbrium altissimum (a)	-	3	2	-	-	1	1	.15	.03
F	Sphaeralcea coccinea	$_{a}$3	$_{b}$18	$_{a}$7	1	1	10	3	.13	.01
F	Taraxacum officinale	-	3	1	-	-	1	1	.00	.00
F	Unknown forb-perennial	$_{b}$7	$_{a}$-	$_{a}$-	-	3	-	-	-	-
Total for Annual Forbs		1	139	6	0	1	59	3	0.49	0.04
Total for Perennial Forbs		103	219	51	14	53	109	24	0.86	0.24
Total for Forbs		104	358	57	14	54	168	27	1.35	0.29

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 5

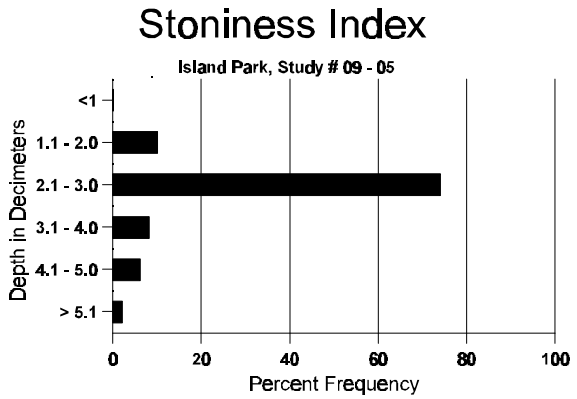
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	79	78	7.76	5.69
B	Eriogonum microthecum	30	15	.19	.16
B	Gutierrezia sarothrae	76	100	.98	12.44
B	Leptodactylon pungens	2	2	.03	.15
B	Opuntia spp.	20	16	.07	.36
Total for Browse		207	211	9.06	18.83

BASIC COVER --
Herd unit 09 , Study no: 5

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	369	323	2.75	4.75	31.06	35.34
Rock	-	-	0	0	0	0
Pavement	2	3	0	0	.01	.15
Litter	397	370	45.50	31.00	32.54	35.04
Cryptogams	245	208	1.00	4.50	10.82	12.38
Bare Ground	320	337	50.75	59.75	31.40	44.68

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 5, Study Name: Island Park

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
12.94	73.4 (14.33)	7.3	57.4	26.7	15.9	0.6	4.0	112.0	0.6



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 5

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	45	10	679	N/A
Elk	6	25	740	57 (141)
Deer	32	21	609	47 (116)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 5

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20			1
Y	82	-	2	-	-	-	-	-	-	-	-	2	-	-	133			2
	88	14	3	-	-	-	-	-	-	-	17	-	-	-	1133			17
	95	11	11	5	1	-	-	-	-	-	28	-	-	-	560			28
	00	3	1	-	-	-	-	-	-	-	4	-	-	-	80			4
M	82	12	18	-	-	-	-	-	-	-	13	17	-	-	2000	17	23	30
	88	1	13	11	-	-	-	-	-	-	22	1	2	-	1666	20	21	25
	95	13	42	17	-	-	-	-	-	-	70	-	2	-	1440	16	25	72
	00	-	3	10	2	4	1	1	-	-	20	-	1	-	420	16	25	21
D	82	6	11	8	-	-	-	-	-	-	4	4	17	-	1666			25
	88	5	20	18	-	-	-	-	-	-	32	1	5	5	2866			43
	95	10	28	26	-	1	-	-	-	-	19	-	-	46	1300			65
	00	18	49	28	3	16	-	-	-	-	45	-	-	69	2280			114
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	1520			76
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	1140			57

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	54%	14%	30%	+33%
'88	42%	34%	14%	-42%
'95	50%	29%	29%	-16%
'00	53%	28%	50%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	3799	Dec:	44%
	'88	5665		51%
	'95	3300		39%
	'00	2780		82%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum microthecum																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	3	-	-	-	-	-	-	-	-	3	-	-	-	200	13	6	3
	88	8	-	-	-	-	-	-	-	-	8	-	-	-	533	9	5	8
	95	39	2	2	-	-	-	-	-	-	43	-	-	-	860	10	10	43
	00	14	3	3	4	-	-	-	-	-	23	-	1	-	480	5	6	24
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+73%
'88	00%	00%	00%	+28%
'95	04%	04%	00%	-51%
'00	12%	12%	04%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
'82	200		0%
'88	733		0%
'95	1020		10%
'00	500		4%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	1327	-	-	1	-	-	-	-	-	1328	-	-	-	26560			1328
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	12	-	-	-	-	-	-	-	-	12	-	-	-	800			12
	88	46	-	-	-	-	-	-	-	-	46	-	-	-	3066			46
	95	65	-	-	-	-	-	-	-	-	65	-	-	-	1300			65
	00	17	-	-	-	-	-	-	-	-	17	-	-	-	340			17
M	82	100	-	-	-	-	-	-	-	-	100	-	-	-	6666	12	10	100
	88	368	-	-	1	-	-	-	-	-	369	-	-	-	24600	8	6	369
	95	108	5	-	-	-	-	-	-	-	113	-	-	-	2260	12	13	113
	00	1386	-	-	-	-	-	-	-	-	1373	-	13	-	27720	8	9	1386
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	40	-	-	-	-	-	-	-	-	35	-	5	-	2666			40
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	103	-	-	-	-	-	-	-	-	65	-	-	38	2060			103
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	320			16

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+75%
'88	00%	00%	01%	-88%
'95	03%	00%	00%	+88%
'00	00%	00%	03%	

Total Plants/Acre (excluding Dead & Seedlings)					
	'82	7466	Dec:		0%
	'88	30332			9%
	'95	3580			1%
	'00	30120			7%

Leptodactylon pungens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	4	8	3
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100	4	8	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+50%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)					
	'82	0	Dec:		-
	'88	0			-
	'95	60			-
	'00	120			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	1	-	-	-	-	1	-	-	4	-	-	-	266			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	2	-	-	-	-	-	-	-	-	-	2	-	-	133	3	5	2
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333	4	8	5
	95	21	-	-	-	-	-	-	-	-	21	-	-	-	420	4	16	21
	00	16	-	-	-	-	-	-	-	-	16	-	-	-	320	4	12	16
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+78%
'88	11%	00%	00%	-27%
'95	00%	00%	00%	-14%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	133	Dec:	0%
	'88	599		0%
	'95	440		5%
	'00	380		11%

Trend Study 9-6-00

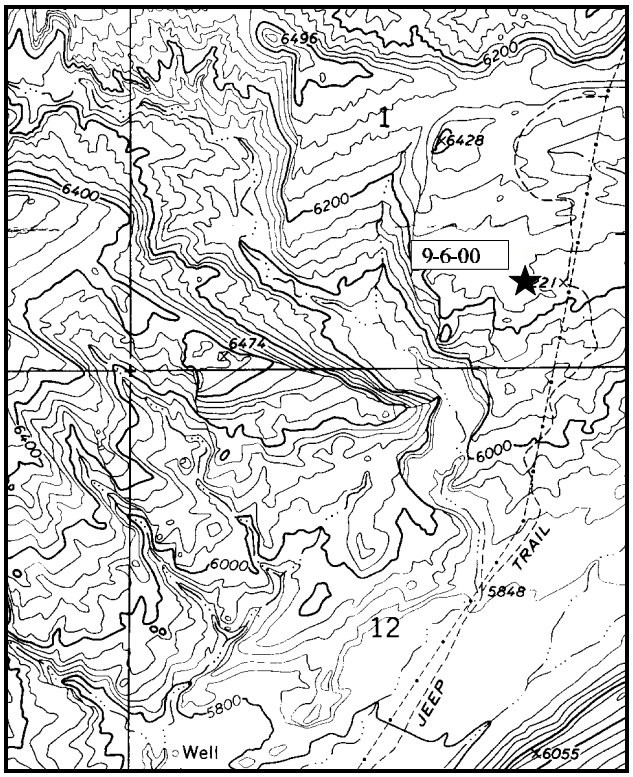
Study site name: Above Steinaker Draw . Range type: Pinyon-Juniper .

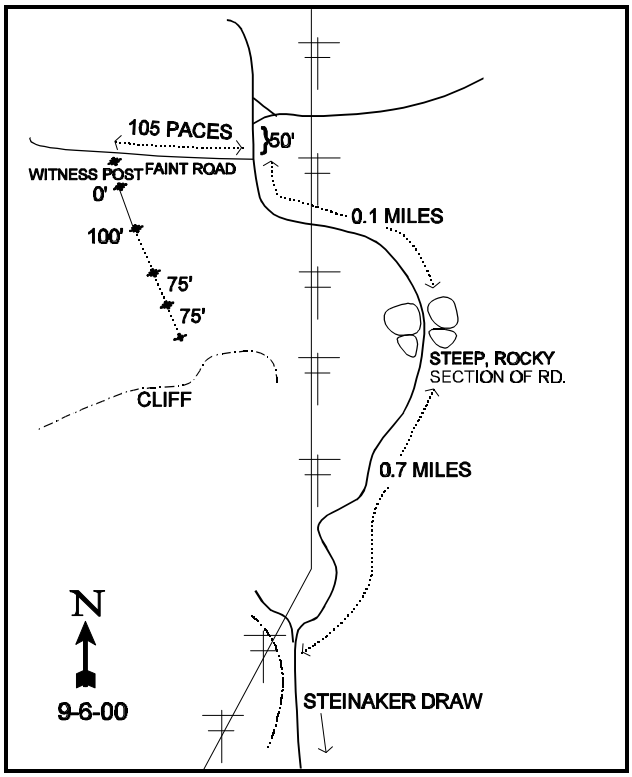
Compass bearing: frequency baseline 143°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

One mile north of Steinaker Reservoir, turn left off highway US 191. Staying to the right, go northeast on the dirt road for approximately 1.85 miles. Just after crossing under the power lines, there is a fork. Bear left at this fork, going 0.4 miles to a fork at the base of the hill. Proceed up the right fork, following the power lines, going approximately 0.85 miles to the top of a rough, sandy 4-WD road. Just after you come up a very steep, rocky section, you top out and the road bends to the right beneath the power lines. Beyond the bend is a faint road leading off to the east. Walk along this trail about 150 yards to a witness post on the left side of the old road. The study site is in the juniper/sage on the south side of the road. The 0-foot baseline stake is 50 feet south of the witness post.





Map Name: Steinaker Reservoir Diagrammatic Sketch

Township 3S , Range 21E , Section 1 UTM 4493282.769 N, 626581.283 E

DISCUSSION

Trend Study No. 9-6 (11-7)

The Above Steinaker Draw study was established in 1988. It is located in an open juniper stand with an understory of Wyoming big sagebrush. This study was added to replace an old study, Steinaker Draw, which was established in 1982 and sampled a little-used desert shrub range type. The study site lies in a small basin that has a gentle slope in the bottom, but gets steeper on the short slopes which run up to sandstone ridges. The general aspect is to the northeast. The area does not receive much snow, where annual precipitation ranges from 9 to 12 inches. The elevation at the site is 6,250 feet. Old sign of wintering deer and elk are abundant at this site, although with several mild winters recently, fresh sign was scarce in 2000. A pellet group transect read along the baseline in 2000 estimates 6 deer days use/acre (15 ddu/ha) and 9 elk days use/acre (22 edu/ha). No cattle pats were sampled in 2000. Cattle graze the area in spring or fall as part of a deferred system. It may be that they have not yet come onto the area when the site was read in 2000.

The soil is a loamy sand in the LaMarsh-Rock Outcrop complex. Estimated effective rooting depth is just over 16 inches and penetrometer readings show rock to be evenly distributed throughout the upper 20 inches of the soil profile. There are areas where soils are more shallow resulting in exposed bedrock. Soils are often without plant cover and tend to support well-developed cryptogams. Cryptogamic crust cover has been high in all years, and is currently (‘00) estimated at 23%. Phosphorus is low at 6.2 ppm, where 10 ppm has been shown to be necessary for normal plant growth and development. Although permeability is rapid, surface runoff is moderate and erosion potential is high. The soil is most vulnerable during high intensity summer thunderstorms. At most other times, erosion is localized and not severe. Moderate pedestaling occurs around the stems of sagebrush and the trunks of juniper trees.

The mature juniper overstory is open with an estimated point-center quarter density of 65 juniper trees/acre with an average diameter of 11.8 inches. Overhead canopy cover is currently (‘00) estimated at 10%. Due to low average precipitation, this site is marginal for pinyon as evidenced by an estimated density of only 6 pinyon trees/acre. Average trunk diameter of pinyon trees is 3 inches.

Openings in the juniper woodland allow for a moderately low density stands of Wyoming big sagebrush to persist throughout this area. On the site itself, Wyoming sagebrush has an estimated density of about 2,600 plants/acre in both 1995 and 2000. Sagebrush cover was estimated at 12% in 1995, and 10% in 2000. Vigor has generally been good with fair growth and seed production in both 1988 and 1995. In 2000, poor vigor slightly increased to 9%, while percent decadency increased a moderate amount from 11% in 1995 to 32%. Increases in poor vigor and percent decadency are most likely due to drought as most use remains at a light level, with few plants showing moderate use. This level of use has been observed in both 1995 and 2000. Recruitment was good in both 1988 and 1995, but at the present time (‘00), recruitment from young plants is only fair (100 plants/acre). Decreased recruitment provides additional evidence that drought is playing a role in the depressed condition of sagebrush on this site. Currently (‘00), annual growth averages only about 2 inches. Spiny hopsage has an estimated density of just under 200 plants/acre for all sampling periods. This species is very palatable and shows moderate utilization. On average, it contributes only about 10% of the browse cover. This small population exhibits several downward population parameters in 2000. Poor vigor increased from 13% to 56%, percent decadency increased from 13% to 78%, and no young plants are being recruited into the population. Other palatable browse on the site include: a low density of moderately utilized green ephedra, scattered black sagebrush and an occasional true mountain mahogany plant. Less desirable browse include a fairly dense population of pricklypear cactus estimated at 2,580 plants/acre in 2000. A few broom snakeweed are also scattered throughout the area.

The herbaceous understory is dominated by annuals. Grass distribution is extremely variable over the site. Some places support a dense stand of cheatgrass, while perennial species are clumped in others. Thickspike wheatgrass, needle-and-thread grass, Sandberg bluegrass and galleta are the most common perennial grasses found on the site. As a group, perennial grasses provide only 3% average cover in 2000. They had a quadrat frequency of only 66%. Both of these are decreases from 1995 data, due most likely to continuing drought. Two annual species, cheatgrass and sixweeks fescue, are normally abundant. Cheatgrass increased in nested frequency, quadrat frequency and average cover in 2000 even with drought. Sixweeks fescue was fairly abundant in 1995, but infrequent in 2000. Forbs are rare, especially so in 2000 with the drought. Twelve perennial species and 8 annual species were sampled in 1995, decreasing to 7 perennial and 5 annual species being sampled in 2000. Currently ('00), lobeleaf groundsel is the most abundant forb. Sum of nested frequency of perennial grasses and forbs decreased by 37% in 2000.

1988 APPARENT TREND ASSESSMENT

The percentage of basal vegetative cover is low (5%), but litter cover is higher than expected (55%). Cryptogams provide a substantial amount of ground cover (21%), thereby reducing the amount of bare soil to 18%, which is low for this type of site. Trend for soil appears stable. Wyoming big sagebrush appears to be slightly down due to its moderately high decadency rate. Apparent trend for the herbaceous understory is stable.

1995 TREND ASSESSMENT

Bare ground slightly increased from 18% to 20%, while cryptogamic cover and litter decreased. Due to the variable ground cover on the site, the much larger sampling design may be responsible for some of the changes in ground cover. Sum of nested frequency of vegetation and litter are high indicating well dispersed cover for these cover classes. Additionally, grasses and forbs account for 43% of the total vegetation cover. Sum of nested frequency of perennial grasses and forbs have also increased since 1988. Taking these factors into consideration, trend for soil is considered stable. Trend for Wyoming big sagebrush is slightly up. Percent decadence has declined from 57% to 11% and heavy use has also declined. The herbaceous understory trend is stable. Sum of nested frequency of perennial grasses decreased, but the most abundant perennial grass, thickspike wheatgrass, remained stable in nested frequency. Sum of nested frequency for perennial forbs increased from 13 to 168.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up (4)
herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is stable. Cover from cryptogams doubled, and bare ground decreased to 17% which is low for this type of community. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil is relatively high at over 4:1 which indicates well disbursed cover over the site. Trend for browse is slightly down. The key species, Wyoming big sagebrush shows increases percent decadency from 11% to 32%, a decrease in recruitment from 16% to 4%, and a slight increase in poor vigor from 2% to 9%. Drought is the principle factor driving these downward trends. With a return to normal precipitation in the future, these parameters should improve. Trend for the herbaceous understory is slightly down. Sum of nested frequency of perennial grasses and forbs decreased by 37% in 2000 due to drought. Composition is poor as annual species make up a significant portion of the understory at this site.

TREND ASSESSMENT
soil - stable (3)
browse - slightly down (2)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 6

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	$_{b}$136	$_{b}$141	$_{a}$60	51	48	24	4.41	.73
G	Bromus tectorum (a)	-	212	249	-	67	83	5.16	5.40
G	Hilaria jamesii	$_{b}$113	$_{a}$13	$_{a}$23	41	7	10	.13	.34
G	Oryzopsis hymenoides	$_{b}$17	$_{a}$4	$_{a}$-	7	2	-	.04	-
G	Poa fendleriana	$_{c}$23	$_{b}$6	$_{a}$-	13	4	-	.04	-
G	Poa secunda	41	40	28	21	16	14	.30	.55
G	Sitanion hystrix	3	-	-	1	-	-	-	-
G	Sporobolus cryptandrus	-	3	-	-	1	-	.38	-
G	Stipa comata	52	33	40	25	13	18	.70	1.36
G	Vulpia octoflora (a)	-	$_{b}$208	$_{a}$21	-	74	9	1.04	.04
Total for Annual Grasses		0	420	270	0	141	92	6.21	5.44
Total for Perennial Grasses		385	240	151	159	91	66	6.02	2.99
Total for Grasses		385	660	421	159	232	158	12.23	8.43
F	Arabis spp.	1	6	-	1	2	-	.01	-
F	Calochortus nuttallii	5	1	-	2	1	-	.00	-
F	Chaenactis douglasii	-	1	-	-	1	-	.00	-
F	Chenopodium leptophyllum (a)	-	$_{b}$34	$_{a}$-	-	18	-	.09	-
F	Collinsia parviflora (a)	-	$_{b}$40	$_{a}$2	-	17	1	.08	.00
F	Cryptantha spp.	$_{a}$1	$_{b}$52	$_{a}$-	1	20	-	.22	-
F	Delphinium nuttallianum	-	-	2	-	-	1	-	.00
F	Descurainia pinnata (a)	$_{b}$4	$_{c}$51	$_{a}$-	3	22	-	.21	-
F	Draba spp. (a)	-	$_{b}$53	$_{a}$-	-	20	-	.14	-
F	Eriogonum cernuum (a)	-	$_{b}$16	$_{a}$-	-	7	-	.03	-
F	Erigeron spp.	$_{a}$-	$_{b}$9	$_{ab}$3	-	5	2	.02	.01
F	Eriogonum spp.	-	5	1	-	2	1	.03	.00
F	Gilia spp. (a)	-	$_{b}$64	$_{a}$-	-	27	-	.21	-
F	Hymenoxys acaulis	$_{a}$-	$_{a}$-	$_{b}$7	-	-	3	-	.01
F	Ipomopsis aggregata	$_{a}$-	$_{b}$8	$_{a}$-	-	3	-	.04	-
F	Lappula occidentalis (a)	-	$_{b}$78	$_{a}$16	-	30	7	.28	.17
F	Lactuca serriola	-	3	-	-	1	-	.01	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Lepidium densiflorum (a)	-	-	2	-	-	1	-	.00
F	Lepidium spp. (a)	$_{b}$9	$_{c}$74	$_{a}$-	4	30	-	.27	-
F	Lomatium spp.	$_{a}$-	$_{ab}$3	$_{b}$4	-	2	3	.03	.06
F	Lupinus argenteus	-	-	-	-	-	-	-	.03
F	Oenothera spp.	-	4	-	-	2	-	.01	-
F	Polygonum douglasii (a)	-	$_{b}$25	$_{a}$2	-	12	1	.06	.00
F	Senecio multilobatus	$_{a}$5	$_{b}$70	$_{b}$80	4	31	31	.15	2.24
F	Sphaeralcea coccinea	1	-	-	1	-	-	-	-
F	Townsendia incana	$_{a}$-	$_{b}$6	$_{b}$8	-	3	4	.04	.02
Total for Annual Forbs		13	435	22	7	183	10	1.39	0.18
Total for Perennial Forbs		13	168	105	9	73	45	0.59	2.38
Total for Forbs		26	603	127	16	256	55	1.98	2.57

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 6

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia nova	0	3	.38	.91
B	Artemisia tridentata wyomingensis	61	62	11.60	10.16
B	Chrysothamnus nauseosus	0	2	-	.06
B	Chrysothamnus viscidiflorus viscidiflorus	14	10	1.64	1.20
B	Ephedra viridis	3	3	.15	.15
B	Grayia spinosa	8	9	1.52	2.36
B	Gutierrezia sarothrae	4	2	.03	-
B	Juniperus osteosperma	0	4	2.20	3.99
B	Opuntia spp.	36	31	1.50	1.01
Total for Browse		126	126	19.03	19.85

CANOPY COVER --
Herd unit 09 , Study no: 6

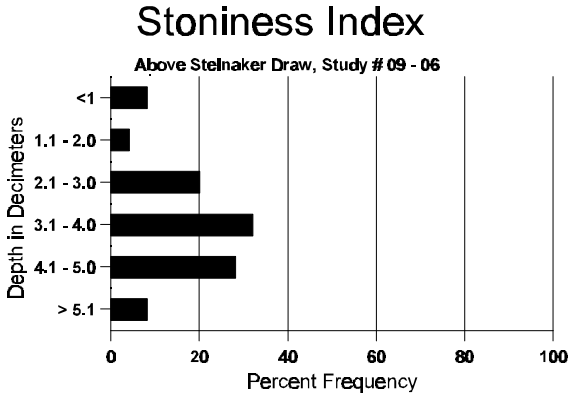
Species	Percent cover	
	'95	'00
Juniperus osteosperma	-	10

BASIC COVER --
Herd unit 09 , Study no: 6

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	355	312	4.75	35.26	31.51
Rock	7	3	.25	.41	.15
Pavement	3	-	0	.00	0
Litter	390	365	55.50	48.90	46.34
Cryptogams	242	305	21.25	11.38	23.07
Bare Ground	237	215	18.25	20.29	17.57

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 6, Study Name: Above Steinaker Draw

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
16.38	35.6 (17.87)	7.0	82.4	7.7	9.9	0.5	6.2	48.0	0.4



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 6

Type	Quadrat Frequency	
	'95	'00
Rabbit	28	67
Elk	29	32
Deer	39	18
Cattle	1	-

Pellet Transect	
Pellet Groups per Acre '00	Days Use per Acre (ha) '00
270	N/A
122	9 (23)
78	6 (15)
-	-

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 6

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	17	0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	18	25	2
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	33%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	0%
	'95	0		0%
	'00	60		33%

Artemisia tridentata wyomingensis																		
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	6	1	-	1	-	-	-	-	-	7	-	1	-	266			8
	95	21	-	-	-	-	-	-	-	-	21	-	-	-	420			21
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	88	7	10	3	-	-	-	-	-	-	20	-	-	-	666	30	24	20
	95	75	18	1	-	-	-	-	-	-	94	-	-	-	1880	26	38	94
	00	59	23	-	2	-	-	-	-	-	84	-	-	-	1680	29	39	84
D	88	12	18	6	1	-	-	-	-	-	36	-	1	-	1233			37
	95	10	-	-	1	-	-	3	-	-	11	-	-	3	280			14
	00	25	10	1	4	-	-	2	-	-	29	1	-	12	840			42
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	660			33

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	45%	14%	03%	+16%
'95	14%	.77%	02%	+ 2%
'00	25%	.76%	09%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	2165	Dec:	57%
	'95	2580		11%
	'00	2620		32%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	38	60	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	28	24	1
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
Y	88	1	-	-	-	-	-	-	-	-	-	-	-	1	33			1
	95	2	1	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	1	-	-	-	-	-	-	-	-	-	-	-	1	33	18	20	1
	95	5	6	-	1	-	-	-	-	-	12	-	-	-	240	19	21	12
	00	9	-	-	1	-	-	-	-	-	10	-	-	-	200	13	13	10
D	88	1	-	-	-	-	-	-	-	-	-	-	-	1	33			1
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	1	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	100%	+69%
'95	44%	00%	00%	-31%
'00	00%	00%	09%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	99	Dec:	33%
	'95	320		6%
	'00	220		9%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ephedra viridis																		
Y	88	-	1	-	1	-	-	-	-	-	2	-	-	-	66			2
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	1	-	-	-	-	-	-	1	-	-	-	33	15	14	1
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	21	24	2
	00	1	2	-	-	-	-	-	-	-	3	-	-	-	60	20	23	3
D	88	-	-	1	-	-	-	-	-	-	1	-	-	-	33			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	25%	50%	00%	-55%
'95	00%	00%	00%	+ 0%
'00	67%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	132	Dec:	25%
	'95	60		0%
	'00	60		0%

Grayia spinosa																		
M	88	1	1	-	-	-	-	-	-	-	2	-	-	-	66	22	23	2
	95	4	2	-	1	-	-	-	-	-	7	-	-	-	140	27	45	7
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	32	47	2
D	88	1	1	1	-	-	-	-	-	-	3	-	-	-	100			3
	95	-	-	1	-	-	-	-	-	-	-	-	-	1	20			1
	00	3	-	-	2	2	-	-	-	-	2	-	-	5	140			7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	40%	20%	00%	- 4%
'95	25%	13%	13%	+11%
'00	22%	00%	56%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	166	Dec:	60%
	'95	160		13%
	'00	180		78%

Gutierrezia sarothrae																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	6	15	-	-	-	-	-	-	-	21	-	-	-	420	12	12	21
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	7	9	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	71%	00%	00%	-90%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	420		-
	'00	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
Y	88	1	-	-	2	-	-	-	-	-	3	-	-	-	100			3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	1	-	-	-	-	-	1	-	-	-	33	72	57	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	2	-	-	3	-	-	-	60	-	-	3
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	1	-	-	1	-	-	1	-	-	1	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	20%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	133	Dec:	0%
	'95	0		0%
	'00	100		40%

Opuntia spp.																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	88	5	-	-	-	-	-	-	-	-	5	-	-	-	166			5
	95	15	-	-	-	-	-	-	-	-	15	-	-	-	300			15
	00	2	-	-	1	-	-	-	-	-	3	-	-	-	60			3
M	88	29	-	-	-	-	-	-	-	-	29	-	-	-	966	3	11	29
	95	161	-	-	-	-	-	-	-	-	161	-	-	-	3220	3	11	161
	00	110	-	-	4	-	-	-	-	-	114	-	-	-	2280	3	12	114
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	11	-	-	1	-	-	-	-	-	3	-	-	9	240			12
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	+68%
'95	00%	00%	00%	-27%
'00	00%	00%	07%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	1132	Dec:	0%
	'95	3520		0%
	'00	2580		9%

Trend Study 9-7-00

Study site name: Warren Draw . Range type: Big Sagebrush-Grass .

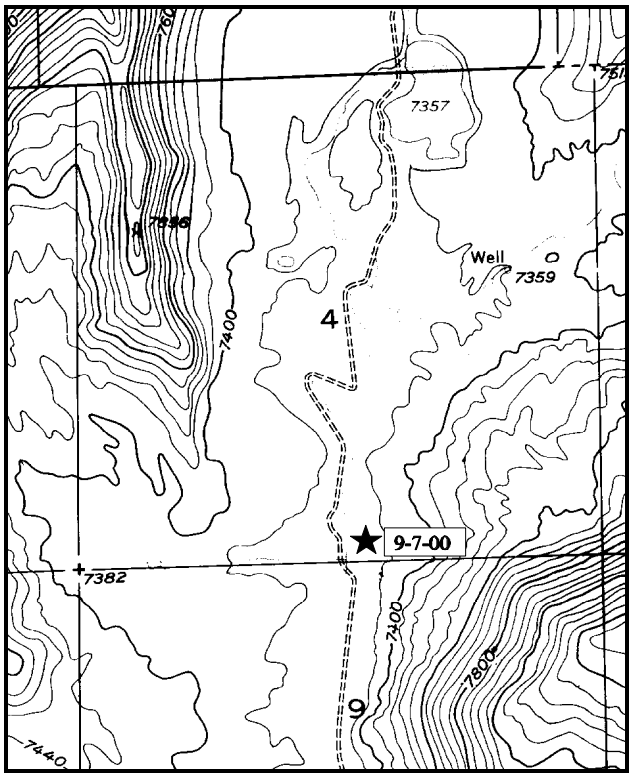
Compass bearing: frequency baseline 2°M .

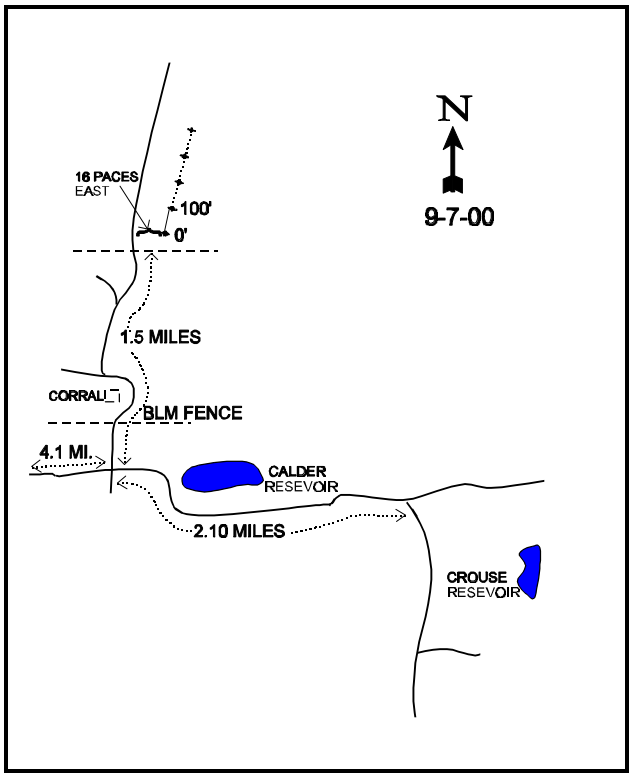
First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the junction between Crouse and Calder reservoirs proceed west 2.1 miles to an intersection. Turn right (north) and go 1.5 miles, past a fence and 2 forks. On the other side of the second fence, a boundary between BLM and DWR land, stop and walk 16 paces east to the 0-foot baseline stake. The frequency baseline is marked with green steel fenceposts approximately 18 inches in height.

Alternative route: From the Diamond Mountain turnoff off US 191 travel east to an intersection just south of Matt Warner reservoir. Turn right towards Calder reservoir and proceed 4.1 miles to a fork. Turn left (north) at this fork and travel 1.5 miles passing through one fence and coming to another. On the other side of the second fence, a boundary between BLM and DWR land, stop and walk 16 paces east to the 0-foot baseline stake. The frequency baseline is marked with green steel fenceposts approximately 18 inches in height.





Map Name: Warren Draw Diagrammatic Sketch

Township 1S , Range 24E , Section 4 UTM 4513014.101 N, 649642.413 E

DISCUSSION

Trend Study No. 9-7 (11-8)

The Warren Draw trend study is located just north of the DWR boundary fence in Warren Draw. The site is on a gentle (10%) west facing slope at an elevation of approximately 7,400 feet. The area is used year-round by deer and elk. There is an abundance of sage grouse sign. Water is readily available in most years with several stock ponds being found within a mile of the site. In 1995, pellet group quadrat frequency data suggested moderately low use by elk and deer. Pellet group quadrat frequency increased for both deer and elk in 2000. A pellet group transect read along the study site baseline in 2000 estimates 22 deer days use/acre (54 ddu/ha) and 8 elk days use/acre (20 edu/ha). One cattle pat was sampled in the transect in 2000.

Soil conditions are good with abundant protective ground cover from vegetation and litter and low amounts of bare soil. Soil texture is a sandy clay loam with a neutral pH. Soil depth is moderate with an estimated effective rooting depth of nearly 13 inches. Some areas close to the site contain black sagebrush indicating localized rooting depth restrictions. Rock and pavement are scarce both on the surface and within the profile. Penetrometer readings used to estimate a profile stoniness index are more indicative of soil compaction in the profile than the presence of rocks. Erosion is slight, but some pedestaling is noted around the older sagebrush stems.

The key browse species on this site is mountain big sagebrush. This sagebrush stand has on average (1995 and 2000) an estimated cover of about 19%. It has a fairly dense population with an estimated 8,940 plants/acre in 2000. Age class analysis indicates the population to be composed of 57% mature plants, 37% decadent plants, with a moderate level of recruitment from young plants at 12% in 2000. Percent decadency has varied over all sampling years. In 1982, decadency was low at 7%, increasing to a high of 51% in 1988. Decadency decreased in 1995 to 20%, but again increased in 2000 to 37%. The proportion of the population showing poor vigor also increased from 1% in 1995 to 11% in 2000. Increases in poor vigor and decadency in 2000 are primarily attributed to drought as several plants were classified with poor vigor due to a chlorotic state and/or loss of leaves. In addition, several sagebrush plants were covered with ants in 2000. Use has varied somewhat between readings. Use is currently (‘00) light to moderate with moderate seed production. Recruitment has remained stable over the past three readings at 12-13%. This reproductive effort currently appears adequate to replace the decadent, dying individuals in the population. Annual growth is fairly low in 2000 averaging about 4 inches over the site.

The only other browse species sampled are slenderbush eriogonum and fringed sagebrush. Snowberry is also scattered around the area in even lower numbers. It was not picked up in the shrub density strips, but was measured for height/crown in 1995.

Even with a high density and cover of sagebrush, the herbaceous understory is abundant on this site. Grasses combined to produce nearly 15% cover in 1995 and 2000, while forbs combined for 24% cover in 1995. Ten perennial grasses were sampled in 2000, with thickspike wheatgrass, mutton bluegrass, and pinewoods needlegrass being the most abundant. These 3 species combine to produce 82% of the grass cover on the site in 2000, with light use being noted on thickspike wheatgrass. Other species include: bottlebrush squirreltail, needle-and-thread, Sandberg bluegrass, prairie junegrass, Kentucky bluegrass and a *Carex*. Perennial grasses slightly decreased in sum of nested frequency in 2000 due to drought. Forbs are diverse and abundant with 22 perennial species encountered in 1995, and 18 species in 2000. Currently (‘00), forbs have decreased in cover to 15% due to drought. The dominant species are mostly mat forming and include: rose pussytoes, desert phlox and clover. Perennial forbs decreased in sum of nested frequency by nearly 30% in 2000 with the dry conditions. Annual forbs were fairly abundant in 1995, especially Douglas knotweed, but were far less abundant in 2000, again with the drought conditions.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable to improving. All nine categories on the apparent trend evaluation form had favorable ratings. Vegetative trend appears stable but is perhaps more precarious at least with respect to the key browse species. Mountain big sagebrush appears to be sustaining itself at the present time, but age, form and vigor class distributions tend to be borderline. Reproduction may be a problem. All of these will be important parameters to monitor in the future.

1988 TREND ASSESSMENT

Soil conditions have improved in some areas but declined in others. Basal vegetative cover has increased from 18% to 23%. Percent litter cover declined slightly while percent bare ground increased. The site is in good condition and the soil trend is considered stable. The key browse species, mountain big sagebrush, displays a slightly improving trend. Even though population density increased dramatically, the proportion of decadent plants also dramatically increased from 7% to 51%. Biotic potential (number of seedlings) is currently high at 28% and the proportion of young plants is good at 13%. The number of mature plants has also increased slightly. The current population could decline in the future if drought conditions persist and cause the high number of decadent sagebrush to die-off. The herbaceous trend is up due to a large increase in the quadrat frequency of grasses and forbs since 1982.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up, but with increased decadency (4)
herbaceous understory - up (5)

1995 TREND ASSESSMENT

Ground cover characteristics have improved in most categories since 1988. Currently, 53% of the ground surface is covered by vegetation, 65% of which consists of herbaceous plants. Percent litter has declined due to the prolonged drought, but cryptogamic cover has increased and percent bare ground has declined from 16% to 14%. Trend for soil is stable. The browse trend is slightly up for mountain big sagebrush. The number of mature plants increased, while the number of decadent shrubs declined from 51% to 20%. The only negative aspect of the browse trend is the moderate and heavy use of the sagebrush. Thirty-four percent of the plants were heavily hedged, up from 9% in 1988. Trend for the herbaceous understory is up due to a large increase in the sum of nested frequency of grasses and forbs. Three species sampled in 1988 increased significantly in nested frequency while three others declined significantly. The main difference in composition is the appearance of thickspike wheatgrass. If identification is accurate in the past, it appears that thickspike is coming into the site and squirreltail is going out.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up (4)
herbaceous understory - up (5)

2000 TREND ASSESSMENT

Trend for soil is stable. Vegetation and litter cover are abundant with the proportion of bare ground remaining about the same. Erosion is minimal as a result. Trend for browse is stable. Mountain big sagebrush shows increases in poor vigor and decadency, but these increases can be attributed to drought and should improve with normal precipitation in the future. Recruitment remains good at 12%, and the number of young plants is adequate to replace the decadent-dying individuals in the population if any should be lost to die-off. Use also decreased to a more moderate level compared to that in 1995. Trend for the herbaceous understory is slightly down due to drought. Sum of nested frequency slightly decreased for perennial grasses, and moderately decreased for perennial forbs.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 7

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a-	b265	b279	-	-	93	91	2.48	3.87
G	Agropyron intermedium	-	-	4	-	-	-	1	-	.15
G	Carex spp.	26	29	18	28	11	13	6	.14	.30
G	Festuca ovina	b20	c30	a-	7	6	15	-	.29	-
G	Koeleria cristata	b51	a9	a11	2	21	4	5	.04	.05
G	Poa fendleriana	a41	a79	b153	-	15	27	59	1.52	5.07
G	Poa pratensis	a-	b27	b10	-	-	8	3	.43	.21
G	Poa secunda	89	108	79	-	33	46	31	1.08	.98
G	Sitanion hystrix	c278	b52	a13	-	93	25	6	2.23	.25
G	Stipa comata	b57	ab65	a34	-	24	30	13	1.72	.67
G	Stipa pinetorum	188	177	136	5	73	69	55	4.61	3.60
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		750	841	737	42	276	330	270	14.58	15.18
Total for Grasses		750	841	737	42	276	330	270	14.58	15.18
F	Achillea millefolium	34	33	42	13	15	12	16	.34	.71
F	Agoseris glauca	a-	a-	b5	-	-	-	3	-	.01
F	Allium spp.	-	2	2	-	-	2	2	.01	.03
F	Antennaria rosea	191	189	196	41	75	71	76	5.49	6.70
F	Androsace septentrionalis (a)	-	b36	a18	6	-	18	9	.09	.04
F	Arabis drummondi	24	7	4	1	8	5	3	.03	.01
F	Artemisia ludoviciana	1	-	-	1	1	-	-	-	-
F	Astragalus aretioides	1	1	-	-	1	1	-	.00	-
F	Aster spp.	15	24	23	1	5	9	10	.09	.17
F	Chenopodium leptophyllum (a)	-	b6	a-	-	-	3	-	.01	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Collinsia parviflora (a)	-	$_{b}$43	$_{a}$7	-	-	18	3	.26	.01
F	Cryptantha spp.	-	1	-	-	-	1	-	.00	-
F	Delphinium nuttallianum	-	6	-	-	-	2	-	.03	-
F	Descurainia pinnata (a)	1	1	-	-	1	1	-	.00	-
F	Draba spp. (a)	-	-	3	-	-	-	2	-	.01
F	Erigeron eatonii	$_{b}$136	$_{b}$157	$_{a}$65	52	62	64	34	.62	.37
F	Erigeron flagellaris	$_{a}$-	$_{a}$-	$_{b}$11	-	-	-	7	-	.11
F	Gayophytum ramosissimum (a)	-	$_{b}$18	$_{a}$-	-	-	8	-	.09	-
F	Heterotheca villosa	-	2	-	-	-	1	-	.00	-
F	Hymenoxys richardsonii	3	3	3	2	1	1	1	.03	.03
F	Lupinus argenteus	24	44	17	21	10	25	9	1.44	.56
F	Lychnis drummondii	$_{a}$-	$_{b}$5	$_{a}$-	5	-	3	-	.06	-
F	Microsteris gracilis (a)	-	6	2	-	-	4	1	.02	.00
F	Navarretia spp.	$_{a}$-	$_{b}$14	$_{a}$-	-	-	6	-	.08	-
F	Orthocarpus luteus (a)	-	$_{b}$109	$_{a}$30	-	-	42	16	3.04	.16
F	Orobanche spp.	-	2	-	-	-	1	-	.00	-
F	Penstemon spp.	$_{b}$13	$_{a}$1	$_{ab}$6	-	7	1	3	.00	.09
F	Phlox austromontana	$_{b}$234	$_{a}$172	$_{a}$161	48	84	55	61	10.77	5.90
F	Phlox longifolia	$_{a}$52	$_{b}$81	$_{a}$39	4	26	39	14	.34	.07
F	Polygonum douglasii (a)	-	$_{b}$161	$_{a}$12	-	-	60	6	.59	.03
F	Potentilla gracilis	-	2	6	2	-	1	2	.03	.01
F	Taraxacum officinale	$_{ab}$18	$_{b}$38	$_{a}$16	-	9	17	8	.13	.21
F	Tragopogon dubius	-	-	3	-	-	-	2	-	.01
F	Trifolium gymnocarpon	$_{a}$-	$_{c}$113	$_{b}$41	37	-	49	17	.27	.23
F	Unknown forb-annual (a)	-	3	-	-	-	1	-	.00	-
F	Unknown forb-perennial	$_{b}$11	$_{a}$-	$_{a}$-	3	6	-	-	-	-
F	Zigadenus elegans	$_{a}$-	$_{ab}$3	$_{b}$12	-	-	1	5	.00	.12
Total for Annual Forbs		1	383	72	0	1	155	37	4.12	0.26
Total for Perennial Forbs		757	900	652	237	310	367	273	19.82	15.39
Total for Forbs		758	1283	724	237	311	522	310	23.94	15.65

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 7

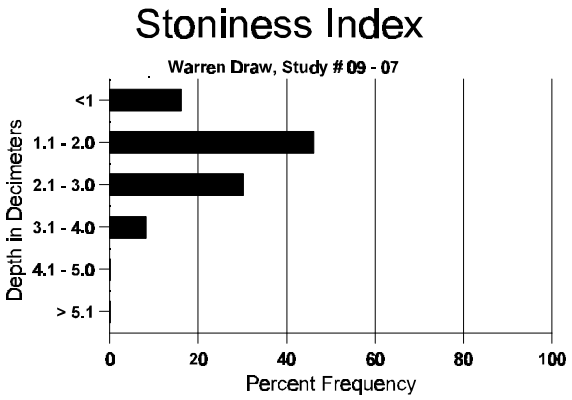
Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Artemisia frigida	0	1	-	-
B	Artemisia tridentata vaseyana	99	97	20.41	18.76
B	Eriogonum microthecum	3	3	.03	.01
Total for Browse		102	101	20.45	18.77

BASIC COVER --
Herd unit 09 , Study no: 7

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '82	Average Cover % '88	Average Cover % '95	Average Cover % '00
Vegetation	379	369	18.25	23.00	53.39	57.93
Rock	28	8	1.25	1.50	.16	.08
Pavement	14	24	0	0	.07	.09
Litter	394	388	65.50	59.00	50.50	66.19
Cryptogams	90	77	.25	.50	1.31	1.22
Bare Ground	264	214	14.75	16.00	13.86	13.88

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 7, Study Name: Warren Draw

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
12.93	60.0 (13.46)	6.6	63.4	16.7	19.9	2.1	20.4	265.6	0.8



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 7

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	'00	'00
Rabbit	3	13	218	N/A
Elk	14	21	104	8 (20)
Deer	10	24	287	22 (55)
Cattle	2	1	9	1 (2)
Moose	-	-	35	2 (5)
Antelope	-	-	18	1 (2)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 7

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia frigida																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	4	5	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	40	-	1	4	-	-	-	-	-	43	-	1	1	3000			45
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	14	5	-	2	-	-	-	-	-	19	2	-	-	1400			21
	95	27	11	9	-	-	-	-	-	-	47	-	-	-	940			47
	00	43	5	-	5	-	-	-	-	-	52	-	1	-	1060			53
M	82	25	15	13	-	-	-	-	-	-	53	-	-	-	3533	18	31	53
	88	8	41	8	1	-	-	-	-	-	53	1	4	-	3866	21	25	58
	95	83	75	83	6	-	-	-	-	-	247	-	-	-	4940	16	29	247
	00	154	61	14	-	-	-	-	-	-	228	1	-	-	4580	17	29	229
D	82	-	2	2	-	-	-	-	-	-	-	-	4	-	266			4
	88	21	55	6	-	-	-	-	-	-	71	1	6	4	5466			82
	95	15	24	32	-	1	-	-	-	-	67	-	-	5	1440			72
	00	108	43	8	2	4	-	-	-	-	111	4	-	50	3300			165
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	840			42
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	1120			56

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	30%	26%	07%	+65%
'88	63%	09%	09%	-32%
'95	30%	34%	01%	+18%
'00	25%	05%	11%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	3799	Dec:	7%
	'88	10732		51%
	'95	7320		20%
	'00	8940		37%

Eriogonum microthecum																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100	4	15	5
	00	3	-	-	-	-	-	-	-	-	1	-	2	-	60	6	9	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	-40%
'00	00%	00%	67%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	100		-
	'00	60		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	11	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	0		-

Trend Study 9-8-00

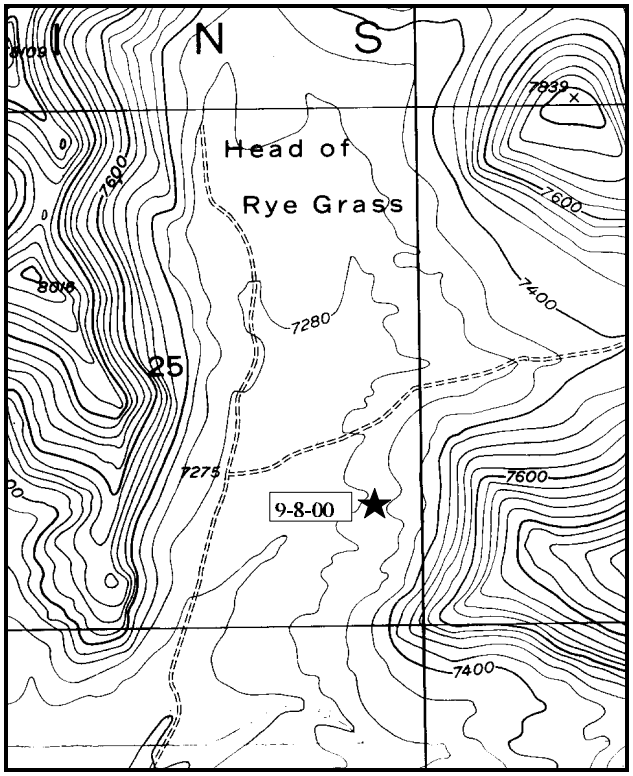
Study site name: Rye Grass . Range type: Big Sagebrush-Grass .

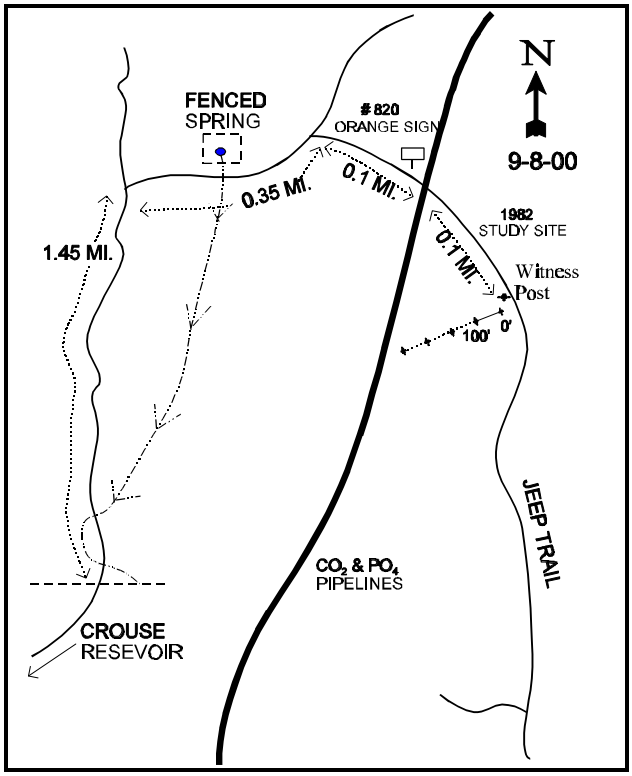
Compass bearing: frequency baseline 232°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Crouse Reservoir, proceed north up Mail Draw for 4 miles. Turn right and proceed towards the Head of Rye Grass valley. Go 0.4 miles to a fence. Continue 1.45 miles to a fork. Turn right and proceed 0.35 miles, crossing the wash, then turn right towards the pipeline. Go 0.l miles to the pipeline. Cross the pipeline and head back south 0.1 miles to the study on the right side of the road. This study site is adjacent to the 1982 study area, which was destroyed by pipeline construction. The 0-foot baseline stake is about 10 feet west of the road. All study stakes are short green fenceposts.





Map Name: Warren Draw Diagrammatic Sketch

Township lN , Range 24E , Section 25 UTM 4516781.432 N, 656532.518 E

DISCUSSION

Trend Study No. 9-8 (11-9)

The Rye Grass study samples winter range in Rye Grass Draw on Diamond Mountain. The study was placed on Division owned property because it was used by a substantial number of deer and elk in most years. There was evidence of year-round use; antler drops, recent deer pellet groups, a winter-killed fawn, elk pellet groups, and the remains of a newborn calf in 1988. This important area was originally sampled with a trend study further up the slope in a mixed sagebrush and mountain mahogany type. The old trend study, #25-8-82, was disturbed by underground gas pipeline construction and was relocated 175 yards to the south in a more open sagebrush-grass flat, typical of the valley location. Data from the 1982 reading was left in the report and some changes in cover measurements and shrub densities are due mostly to the relocation, but general trends can still be determined. A pellet group transect read along the baseline in 2000 estimates light use by wildlife with 9 deer days use/acre (22 ddu/ha) and 7 elk days use/acre (17 edu/ha) on the site. Several successive mild winters most likely account for the current light level of use by big game on this site.

The study site is on an 8% slope with a southwest exposure at an elevation of 7,300 feet. Soils are a sandy clay loam texture and are neutral in reactivity (pH of 6.6). Estimated effective rooting depth over the entire site is nearly 15 inches, but soil depth is variable as indicated by the mixture of black sagebrush and mountain big sagebrush. Phosphorus is low at 7.6 ppm as values less than 10 ppm may limit normal plant growth and development. Shrub interspaces contain a lot of exposed bare soil, but erosion is minimal. Bare ground moderately increased in 2000, while litter cover slightly decreased.

The valley floor in Rye Grass Draw is dominated by mountain big sagebrush with a significant component of black sagebrush, grasses, and forbs. Mountain big sagebrush averaged 11% cover in 1988 with a density of 4,199 plants/acre. Fifty-four percent of the population consisted of large decadent plants and 24% were mature. Reproductive potential (percent of seedlings to the population) was high at 33%, with 22% of the population classified as young. Use was light to moderate with 13% of the shrubs displaying heavy hedging. With the much larger sample utilized in 1995, mountain big sagebrush averaged 16% cover with an estimated 4,900 plants/acre. The number of decadent plants declined to only 16%, while mature plants increased to 73% of the population. It appeared that many of the decadent plants sampled in 1988 had recovered. Use was light to moderate and vigor good on all but 2% of the population. In 2000, mountain big sagebrush is estimated at 5,460 plants/acre and 19% cover. Percent decadency slightly increased to 27%, with poor vigor increasing to 15%. Heavy use increased to an estimated 21% of the population. However, with apparent light use from wildlife, heavy use may have been overestimated in 2000 due to many plants having a hedged appearance due to a very low annual growth. It was noted in 2000 that some mountain big sagebrush plants had a lot of leader growth while others had virtually none. As with other sites in this unit, increases in decadency and poor vigor and low annual growth are most likely drought related. These parameters should improve with a return to normal precipitation patterns. Currently (‘00), recruitment is fair with an estimated 340 young plants/acre. However, there is twice as many decadent, dying plants (780 plants/acre) as young ones which could result in some population loss in the future.

Black sagebrush is numerous, but only accounted for 6% of the browse cover in 2000. Mature plants are relatively small (8" x 15") and normally occur in small, dense patches. It was reported in the 1988 that nearly all of the black sagebrush counted that year occurred in one of the three density plots. This inflated the actual density which was reported at 7,866 plants/acre with 75% of the population being classified as decadent. Use was moderate to heavy with good vigor on all but 15% of the decadent plants. Seedlings were extremely numerous. The much larger, better distributed sample taken in 1995 more accurately estimates black sagebrush density. The black sagebrush density is much more consistent with the larger sampling design, where its density has been about 2,700 plants/acre in both 1995 and 2000. Percent decadency is currently (‘00) 14%, an increase

from 4% in 1995. Use is estimated at a moderate to heavy level in 2000, but as with mountain big sagebrush at this site, this may be overestimated due to low annual growth.

Slenderbush eriogonum is abundant throughout the site and lightly hedged. Only one small, dying serviceberry was found on the study site in 1988. Serviceberry and curlleaf mountain mahogany are more common on the surrounding slopes than in the valley bottom. Other shrubs sampled include: mountain low rabbitbrush, broom snakeweed and gray horsebrush.

Herbaceous vegetation is diverse on the site with grasses and forbs each producing 8% to 10% average cover in 1995 and 2000. Herbaceous cover actually declined from 1995 estimates due to drought. Nine grass species, all perennials, were identified in 1995 and 2000. Thickspike wheatgrass, bluebunch wheatgrass, mutton bluegrass, Sandberg bluegrass and needle-and-thread were the most abundant. Nearly all of these species, except for thickspike, significantly decreased in nested frequency in 2000. Twenty-eight species of perennial forbs were identified in 1995, where only 24 species were identified in 2000. Rose pussytoes, timber poisonvetch, hairy goldaster, rock goldenrod and Hood's phlox are the most abundant. Sum of nested frequency for forbs slightly decreased in 2000 with drought.

1982 APPARENT TREND ASSESSMENT

Both soil and vegetative trends appear stable to improving. This site is in generally good condition. A possible increase of broom snakeweed is a potential problem, but from an overall standpoint, current management seems adequate.

1988 TREND ASSESSMENT

Even with a moderately dense sagebrush population and an abundant and diverse understory, there is a higher than expected estimate for bare soil on this site (38%). Basal vegetative cover is adequate at 13%, but the site is deficient in litter cover. However, bare spots are not continuous and do not encourage serious erosion. Trend for soil appears stable. Due to the extremely dry conditions, both key browse species on the site have very high decadency rates. Biotic potential (# of seedlings) is excellent for both species and young plants are also adequate. Trend for both black sagebrush and mountain big sagebrush is slightly down. The herbaceous understory is diverse, but not particularly abundant. Herbaceous trend is up compared to the data from the original site.

TREND ASSESSMENT
soil - stable (3)
browse - slightly down (2)
herbaceous understory - up (5)

1995 TREND ASSESSMENT

Ground cover conditions have improved somewhat since the last reading. Percent litter has declined slightly but percent bare ground has also declined from 38% to 27%. Nested frequency of grasses and forbs have declined, yet herbaceous vegetation produces 50% of the vegetative cover and nested frequency for vegetation and litter are high indicating well dispersed cover. Trend for soil is slightly up. Trend for browse is slightly up for both mountain big sagebrush and black sagebrush. The high number of decadent black sagebrush sampled in 1988 were not encountered in 1995. This transect was read in mid-September of 1988 which was a very dry year. According to weather data from Flaming Gorge Dam, normal annual precipitation averages about 16 inches. From 1987 through 1989, conditions were unusually dry with only 10.2", 9.5" and 9.6" of precipitation measured respectively. Due to the lack of many dead plants (20 plants/acre), it is evident that no large die-off

has occurred. Plants had likely dropped many of their leaves by September of 1988 and were mistakenly classified as decadent. Mature black sagebrush have increased from 1,600 plants/acre to 2,000. Decadency of mountain big sagebrush has also improved from 54% to 16%. The number of mature plants increased along with average height and crown measurements. Trend for the herbaceous understory is down due to a large decline in the sum of nested frequency of grasses and forbs. All grass species except bluebunch wheatgrass declined in nested frequency. Three species significantly declined.

TREND ASSESSMENT
soil - slightly up (4)
browse - slightly up for black sagebrush and mountain big sagebrush (4)
herbaceous understory - downward (1)

2000 TREND ASSESSMENT

Although bare ground increased in 2000, trend for soil is still considered stable. Erosion remains minimal as nested frequency of vegetation and litter are high indicating well disbursed protective cover. Trend for browse is stable. The mountain big sagebrush and black sagebrush populations both increased in decadency, but in a drought year these increases are not severe. Current decadency levels are much lower than those of the drought year in 1988. Use is estimated at higher levels for both species in 2000. However due to drought, annual growth is low and many sagebrush plants have a more hedged appearance than normally observed. As a result, use may have been overestimated on both species. Normal precipitation in the future will likely result in decreased decadency and better annual growth on sagebrush. Trend for the herbaceous understory is slightly down overall. Perennial grasses moderately decreased in sum of nested frequency and perennial forbs slightly decreased in sum of nested frequency due to the dry conditions in 2000.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	$_{b}$208	$_{a}$140	$_{ab}$186	60	78	51	68	1.38	1.62
G	Agropyron spicatum	$_{a}$68	$_{b}$138	$_{a}$84	58	32	50	33	1.74	1.75
G	Carex spp.	9	5	8	10	7	2	4	.53	.44
G	Elymus cinereus	4	-	-	-	2	-	-	-	-
G	Koeleria cristata	$_{c}$111	$_{b}$46	$_{a}$26	35	56	24	9	.32	.43
G	Oryzopsis hymenoides	-	-	-	2	-	-	-	-	-
G	Poa fendleriana	156	93	112	24	63	37	44	.92	2.46
G	Poa secunda	$_{b}$185	$_{b}$138	$_{a}$56	93	76	55	20	1.14	.37
G	Sitanion hystrix	2	3	2	38	1	1	1	.00	.00
G	Stipa comata	$_{c}$190	$_{b}$153	$_{a}$30	62	78	59	11	3.41	.40
G	Stipa lettermani	$_{ab}$36	$_{b}$41	$_{a}$13	10	15	16	5	.91	.12
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		969	757	517	392	408	295	195	10.38	7.62
Total for Grasses		969	757	517	392	408	295	195	10.38	7.62
F	Allium spp.	-	-	-	4	-	-	-	-	-
F	Antennaria rosea	$_{b}$128	$_{a}$56	$_{b}$101	-	50	23	36	1.21	2.29
F	Arabis spp.	$_{b}$19	$_{a}$3	$_{a}$-	-	12	2	-	.01	-
F	Astragalus argophyllus	-	3	2	-	-	1	1	.00	.03
F	Astragalus convallarius	$_{b}$127	$_{a}$86	$_{a}$80	16	63	45	41	2.30	1.27
F	Aster spp.	-	-	1	-	-	-	1	-	.00
F	Balsamorhiza hookeri	$_{b}$69	$_{a}$36	$_{a}$35	-	32	20	21	.27	.33
F	Calochortus nuttallii	$_{a}$-	$_{b}$9	$_{a}$-	-	-	5	-	.02	-
F	Chaenactis douglasii	7	10	8	1	5	4	4	.02	.04
F	Comandra pallida	$_{b}$33	$_{a}$16	$_{a}$19	-	17	9	8	.05	.06
F	Collinsia parviflora (a)	-	3	1	-	-	1	1	.00	.00
F	Crepis acuminata	-	1	-	-	-	1	-	.00	-
F	Erigeron eatonii	$_{a}$-	$_{b}$17	$_{b}$15	-	-	9	7	.07	.06
F	Erigeron flagellaris	$_{b}$67	$_{a}$16	$_{a}$4	2	34	6	2	.05	.03
F	Eriogonum umbellatum	$_{b}$14	$_{a}$-	$_{c}$28	1	5	-	14	-	.24
F	Gayophytum ramosissimum (a)	-	$_{b}$114	$_{a}$5	-	-	45	2	.42	.01
F	Gilia spp	-	-	-	5	-	-	-	-	-
F	Heterotheca villosa	$_{a}$8	$_{a}$14	$_{b}$30	28	3	6	10	.49	.58
F	Hymenoxys richardsonii	11	10	21	-	4	5	8	.10	.16
F	Ipomopsis aggregata	$_{a}$3	$_{ab}$11	$_{b}$1	-	2	5	1	.02	.00
F	Lappula occidentalis (a)	-	1	-	-	-	1	-	.00	-
F	Lactuca serriola	$_{a}$-	$_{b}$5	$_{ab}$3	-	-	4	1	.02	.00

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Lithospermum spp.	2	-	2	-	1	-	1	-	.00
F	Lomatium spp.	5	4	4	-	4	2	2	.01	.01
F	Lupinus argenteus	$_{a}$-	$_{ab}$2	$_{b}$8	20	-	1	4	.00	.21
F	Machaeranthera grindelioides	3	2	-	-	2	1	-	.00	-
F	Microsteris gracilis (a)	-	$_{b}$7	$_{a}$-	-	-	4	-	.02	-
F	Orthocarpus luteus (a)	-	26	43	6	-	11	21	.47	.38
F	Pedicularis centruthera	-	-	-	12	-	-	-	-	-
F	Penstemon humilis	$_{c}$92	$_{b}$69	$_{a}$22	3	44	29	10	.62	.12
F	Petradoria pumila	$_{b}$30	$_{ab}$28	$_{a}$15	-	15	11	8	2.60	.39
F	Phlox hoodii	$_{b}$118	$_{a}$71	$_{a}$67	-	46	31	29	1.16	.91
F	Phlox longifolia	$_{b}$8	$_{a}$-	$_{ab}$2	-	4	-	2	-	.01
F	Polygonum douglasii (a)	-	20	14	-	-	9	6	.04	.03
F	Sedum lanceolatum	-	-	-	2	-	-	-	-	-
F	Senecio multilobatus	$_{b}$6	$_{b}$7	$_{a}$-	6	4	3	-	.01	-
F	Sphaeralcea coccinea	$_{b}$62	$_{ab}$38	$_{a}$24	-	25	16	10	.25	.12
F	Taraxacum officinale	$_{a}$3	$_{b}$17	$_{ab}$13	-	1	9	6	.04	.08
F	Tragopogon dubius	-	3	-	-	-	1	-	.00	-
F	Trifolium gymnocarpon	$_{a}$4	$_{b}$52	$_{a}$10	4	2	23	5	.21	.02
F	Valeriana edulis	4	-	-	-	2	-	-	-	-
Total for Annual Forbs		0	171	63	0	0	71	30	0.97	0.42
Total for Perennial Forbs		823	586	515	110	377	272	232	9.62	7.05
Total for Forbs		823	757	578	110	377	343	262	10.59	7.48

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 8

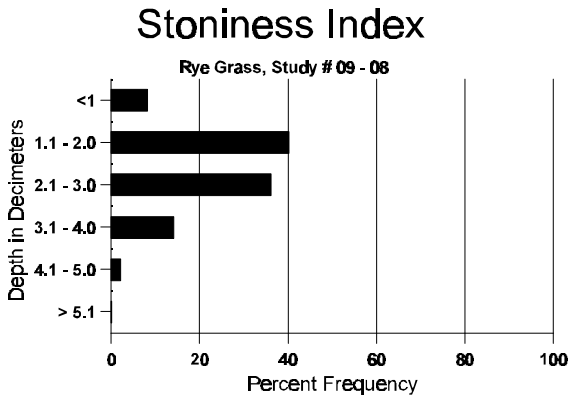
Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Amelanchier alnifolia	0	1	-	-
B	Artemisia nova	29	20	2.40	1.41
B	Artemisia tridentata vaseyana	94	93	16.35	19.31
B	Ceratoides lanata	1	2	-	-
B	Chrysothamnus viscidiflorus lanceolatus	17	5	.04	.03
B	Eriogonum microthecum	61	44	1.53	.55
B	Gutierrezia sarothrae	34	23	.84	.80
B	Pediocactus simpsonii	4	4	.03	.03
B	Tetradymia canescens	6	0	-	-
Total for Browse		246	192	21.21	22.15

BASIC COVER --
Herd unit 09 , Study no: 8

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '82	Average Cover % '88	Average Cover % '95	Average Cover % '00
Vegetation	366	342	7.25	13.00	37.97	37.80
Rock	66	29	1.75	1.00	.99	.91
Pavement	206	135	0	4.50	2.83	2.35
Litter	395	373	67.75	43.25	40.59	37.79
Cryptogams	35	33	.75	.50	.32	.42
Bare Ground	330	322	22.50	37.75	26.97	44.37

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 8, Study Name: Rye Grass

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
14.83	64.2 (15.20)	6.6	64.3	12.2	20.6	1.5	7.6	92.8	0.8



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 8

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Sheep	-	2	-	-
Rabbit	23	32	609	N/A
Moose	-	1	17	1 (2)
Elk	24	9	96	7 (18)
Deer	25	9	113	9 (22)
Cattle	6	2	-	-

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 8

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20			1
M	82	-	1	-	-	-	-	-	-	-	-	1	-	-	66	10	12	1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	-	-	1	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	100%	00%	00%	+ 0%
'88	00%	00%	100%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	66	Dec:		0%
'88	66			100%
'95	0			0%
'00	20			0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	83	-	1	-	-	-	-	-	-	84	-	-	-	5600			84
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	7	-	-	-	-	-	-	-	-	7	-	-	-	466			7
	88	1	3	1	-	-	-	-	-	-	5	-	-	-	333			5
	95	29	-	-	-	-	-	-	-	-	29	-	-	-	580			29
	00	-	2	-	-	-	-	-	-	-	2	-	-	-	40			2
M	82	17	2	-	-	-	-	-	-	-	19	-	-	-	1266	8	20	19
	88	7	11	5	-	-	1	-	-	-	24	-	-	-	1600	5	10	24
	95	79	20	1	-	-	-	-	-	-	100	-	-	-	2000	5	16	100
	00	12	34	69	-	-	-	-	-	-	115	-	-	-	2300	8	15	115
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	13	35	41	-	-	-	-	-	-	76	-	13	-	5933			89
	95	1	3	1	-	-	-	-	-	-	4	-	-	1	100			5
	00	1	13	5	-	-	-	-	-	-	13	-	-	6	380			19
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	08%	00%	00%	+78%
'88	42%	41%	11%	-66%
'95	17%	01%	.74%	+ 1%
'00	36%	54%	04%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	1732	Dec:	0%
	'88	7866		75%
	'95	2680		4%
	'00	2720		14%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	18	2	-	1	-	-	-	-	-	21	-	-	-	1400			21
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
Y	82	6	-	-	-	-	-	-	-	-	6	-	-	-	400			6
	88	12	1	1	-	-	-	-	-	-	14	-	-	-	933			14
	95	19	7	-	-	-	-	-	-	-	26	-	-	-	520			26
	00	14	3	-	-	-	-	-	-	-	17	-	-	-	340			17
M	82	13	-	-	-	-	-	-	-	-	13	-	-	-	866	23	39	13
	88	5	9	1	-	-	-	-	-	-	14	1	-	-	1000	14	20	15
	95	76	98	6	-	-	-	-	-	-	180	-	-	-	3600	17	32	180
	00	76	58	47	1	-	-	-	-	-	181	-	1	-	3640	18	29	182
D	82	2	-	-	-	-	-	-	-	-	1	1	-	-	133			2
	88	9	19	6	-	-	-	-	-	-	30	-	2	2	2266			34
	95	6	26	7	-	-	-	-	-	-	33	-	-	6	780			39
	00	39	13	10	2	4	1	5	-	-	34	-	1	39	1480			74
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	640			32
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	640			32

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	46%	13%	06%	+67%
'95	53%	05%	02%	+14%
'00	29%	21%	15%	+10%

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	1399	Dec:	10%
	'88	4199		54%
	'95	4900		16%
	'00	5460		27%

Ceratoides lanata																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	8	16	1
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	11	9	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+50%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	20		-
	'00	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus ledifolius																		
Y	82	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	10	-	-	-	-	-	-	-	-	10	-	-	-	666	13	16	10
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	999	Dec:	-
	'88	0		-
	'95	0		-
	'00	0		-

Chrysothamnus viscidiflorus lanceolatus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	3	1	-	-	-	-	-	-	-	3	-	1	-	266			4
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	2	-	2	-	-	-	-	-	6	-	-	-	400			6
	95	6	-	-	1	-	-	-	-	-	7	-	-	-	140			7
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	1	-	-	1	-	-	-	-	-	2	-	-	-	133	5	7	2
	95	9	1	1	2	-	-	-	-	-	13	-	-	-	260	7	9	13
	00	3	-	-	1	-	-	1	-	-	5	-	-	-	100	11	13	5
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	1	-	-	-	-	-	2	-	-	-	133			2
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	20%	00%	00%	-37%
'95	05%	05%	00%	-67%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	0%
	'88	666		20%
	'95	420		5%
	'00	140		14%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum microthecum																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	88	10	-	-	-	-	-	-	-	-	10	-	-	-	666			10
	95	23	-	-	1	-	-	-	-	-	24	-	-	-	480			24
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	82	20	-	-	-	-	-	-	-	-	20	-	-	-	1333	9	5	20
	88	4	2	-	2	-	-	-	-	-	8	-	-	-	533	5	5	8
	95	125	-	-	23	-	-	-	-	-	148	-	-	-	2960	5	7	148
	00	51	-	-	15	-	-	10	-	-	74	-	2	-	1520	5	5	76
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	1	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	5	-	-	5	-	-	-	-	-	6	-	-	4	200			10

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	-17%
'88	11%	05%	00%	+63%
'95	00%	00%	00%	-48%
'00	00%	00%	07%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	1533	Dec:	0%
	'88	1265		5%
	'95	3440		0%
	'00	1800		11%

Gutierrezia sarothrae																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	18	-	-	-	-	-	-	-	-	18	-	-	-	1200			18
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
Y	82	10	-	-	-	-	-	-	-	-	10	-	-	-	666			10
	88	14	-	-	-	-	-	-	-	-	14	-	-	-	933			14
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	53	-	-	-	-	-	-	-	-	53	-	-	-	1060			53
M	82	30	-	-	-	-	-	-	-	-	30	-	-	-	2000	5	6	30
	88	25	-	-	-	-	-	-	-	-	24	1	-	-	1666	5	6	25
	95	79	-	-	2	-	-	-	-	-	81	-	-	-	1620	8	10	81
	00	112	-	-	-	-	-	-	-	-	112	-	-	-	2240	5	5	112

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	- 3%
'88	00%	00%	00%	-38%
'95	00%	00%	00%	+51%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	2666	Dec:	-
	'88	2599		-
	'95	1620		-
	'00	3300		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	4	21	1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	66	Dec:	-
	'88	0		-
	'95	0		-
	'00	0		-

Pediocactus simpsonii																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80	4	5	4
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	2	3	3
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

+ 0%

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	80		-
	'00	80		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20	52	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22	74	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	0		-

Tetradymia canescens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	1	1	-	-	-	-	-	-	-	2	-	-	-	133	5	5	2
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	6	8	2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	50%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

-10%

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	133		-
	'95	120		-
	'00	0		-

Trend Study 9-9-00

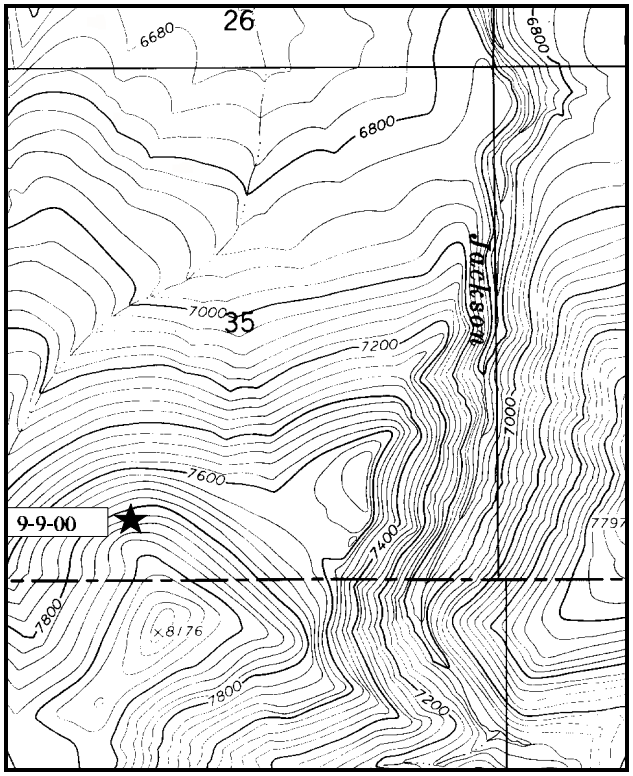
Study site name: Little Hole . Range type: Mixed Mountain Brush .

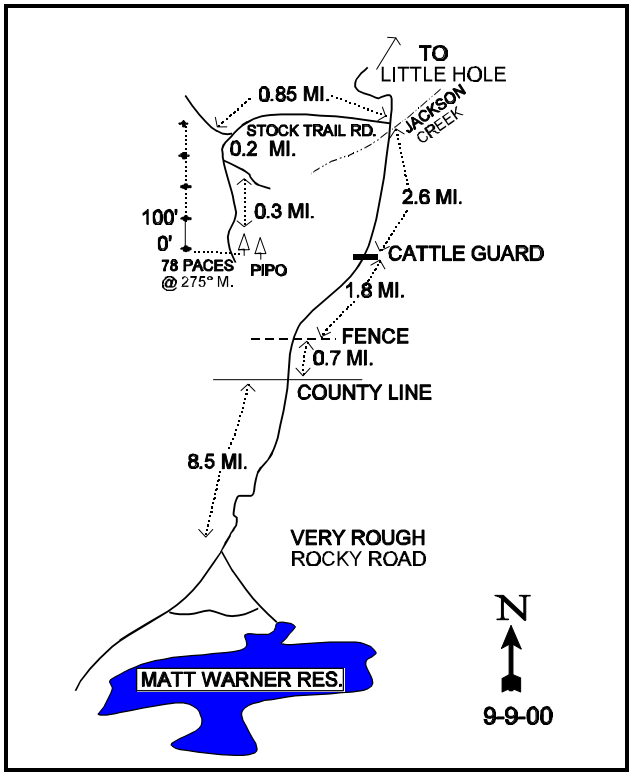
Compass bearing: frequency baseline 345°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of Highway U.S. 191 and the Diamond Mountain Road, take the Diamond Mountain Road to the north to a fork with a sign indicating Browns Park Road 10 miles and Vernal 36 miles. Turn left (north) towards Jackson Draw and proceed down Jackson Draw towards Little Hole. Just past where you cross Jackson Creek, about 4 miles before the end of the road at the Green River, make a left turn and proceed 0.85 miles to an intersection. Bear left, drive about 0.5 miles and stop. From the 2 large ponderosa pines near the road, walk SW (275°M) for 78 paces to a large rock outcropping just below another large ponderosa. From this tree, the 0-foot baseline stake is 21 paces at 206°M. The frequency baseline is marked by 18 inch green fenceposts.





Map Name: Jackson Draw Diagrammatic Sketch

Township 2N ,Range 23E , Section 35 UTM 4525760 N, 643991 E

DISCUSSION

Trend Study No. 9-9 (11-10)

The Little Hole study is on a north facing, 20% slope overlooking the Green River at Little Hole. It is considered an important winter range for deer and elk. The study samples a mixed mountain brush type with scattered pinyon-juniper, Ponderosa pine, and Douglas fir. Elevation is 7,800 feet. This area is managed by the BLM which is grazed by cattle during the summer season from June 1 to October 15. Pellet group transect data taken along the baseline in 2000 estimates light use by livestock at 9 cow days use/acre (22 cdu/ha). Cattle pats sampled appeared to be from the fall of 1999. Wildlife use was also light with an estimated 28 deer days use/acre (69 ddu/ha) and 6 elk days use/acre (15 edu/ha) in 2000.

Soils are derived from igneous parent material and have a sandy clay loam texture. Soil depth characteristically varies as the transect runs downslope. Estimated effective rooting depth is over 12 inches. Penetrometer readings used to estimate a stoniness profile index shows a lot of rock between the surface down to 12 inches. Phosphorus is low at just 6.4 ppm, which is lower than the 10 ppm thought necessary for normal plant growth and development. The soil is slightly acidic in reactivity (pH of 6.2). Erosion potential is moderate on this 20% slope, but due to a somewhat abundant understory, erosion appears to be minimal for the most part. Evidence of past soil movement can be seen by a build-up of soil on the uphill side of shrub and tree stems.

Mountain big sagebrush and antelope bitterbrush are the key browse species and together make up over 75% of the total browse cover. In 2000, cover for sagebrush and bitterbrush was estimated at 17% and 9% respectively. Density of big sagebrush has varied between readings due mostly to the increased sample size used following the 1988 reading. Currently (‘00), big sagebrush is estimated at 3,320 plants/acre with about half of the population being mature plants and the other half being decadent. Percent decadency was estimated at 19% in 1995, more than doubling in 2000 to 47%. This increase in decadency has occurred in the majority of other big sagebrush sites in the region and is primarily attributed to drought. Although the level of decadency is high in 2000, it is still well below the high of 74% in the drought year of 1988. Recruitment from young plants is estimated at 160 plants/acre in 2000, which is nearly the amount of decadent plants classified as dying in the population. Use is currently (‘00) light on mountain big sagebrush. Annual growth is moderately high, averaging 6 inches over the site.

The population of bitterbrush is estimated at 1,540 plants/acre in 2000 with percent decadency being relatively low at 12%. Recruitment is moderately low at 80 plants/acre, but with low decadency and 83% of the population being mature plants, this population appears to be stable. Use increased somewhat in 2000 with heavy use being estimated on 26% of the population, an increase from 1% in 1995. Vigor is good and average leader growth is low in 2000 at about 3 inches.

A small number of true mountain mahogany and serviceberry occur on the site. Mahogany are moderate to heavily hedged in 2000, with poor vigor being estimated on 21% of the population. Density is estimated at 280 plants/acre and decadency is low at 7%. Annual average leader growth on mahogany is 4 inches in 2000. Serviceberry has an estimated density of 120 plants/acre in 2000. Use is moderate to heavy, with no decadent plants and high young recruitment at 33%. The proportion of the population in poor vigor decreased from 33% in 1995 to 17% in 2000.

Other browse found on the site include: mountain low rabbitbrush, slenderbush eriogonum, broom snakeweed, Oregon grape and snowberry. Point-center quarter data in 2000 estimates 42 pinyon trees/acre, 7 juniper trees/acre, 8 ponderosa pine trees/acre, and 5 Douglas fir trees/acre.

The herbaceous understory is diverse, especially the grass component. Perennial grasses provide 36% of the total vegetative cover of the site in 2000, an increase from 24% in 1995. Ten perennial species were sampled in 2000, of which Kentucky bluegrass was by far the most abundant. Kentucky bluegrass increased from 3% average cover in 1995 to 14% in 2000. It now provides 69% of the grass cover on the site. This species has significantly increased in nested frequency since 1995. Thickspike wheatgrass is also moderately abundant on the site. Other species include: oniongrass, bluebunch wheatgrass, mutton bluegrass, Sandberg bluegrass, needle-and-thread, Letterman needlegrass and bottlebrush squirreltail. Grasses had been utilized when the site was read in July 2000. As a group, sum of nested frequency for perennial grasses slightly decreased in 2000 with drought. Individually, 6 of the 10 species sampled significantly decreased in nested frequency in 2000.

Forbs have been diverse in number, but not particularly abundant during any reading. Twenty-two perennial forb species were encountered in 1995, with only hairy goldaster contributing more than 1% cover. Due to drought, only 15 perennial species were sampled in 2000, with sum of nested frequency significantly decreasing. Annual forbs were abundant in 1995, but nearly non-existent in 2000 due to the dry conditions.

1982 APPARENT TREND ASSESSMENT

Overall range trend appears stable to perhaps slightly improving. An apparent increase in antelope bitterbrush is encouraging. A concurrent decline in mountain big sagebrush is less so. If the community is in a state of flux, it will be important to prevent any increase in broom snakeweed or pricklypear. Soil trend appears stable.

1988 TREND ASSESSMENT

Ground cover data show an increase in vegetative cover which is consistent with frequency and density data, although the percentage of rock cover doubled to almost 13%. Percent bare ground declined from 16% to 9%. Soil trend is up. Trend for mountain big sagebrush is slightly down due to an increase in percent decadency. This condition is caused by the unusually dry conditions present this year and will improve with normal precipitation patterns. Trend for antelope bitterbrush is up due to a large increase in seedling and young plants indicating an increasing population. Overall, the browse trend is considered stable. The herbaceous understory trend is up with increased quadrat frequency for both grasses and forbs.

TREND ASSESSMENT
soil - up (5)
browse - stable overall; down for sagebrush and up for bitterbrush (3)
herbaceous understory - up (5)

1995 TREND ASSESSMENT

Soil trend is up slightly due to a decrease in percent bare ground from 9% to 4%. Percent rock cover has declined and litter cover has remained fairly stable. The herbaceous understory makes up only 38% of the vegetative cover, but sum of nested frequency of vegetation and litter cover is high, indicating well dispersed protective cover. Trend for sagebrush is up due to a major decrease in decadency. It appears that most of the decadent shrubs are now normal, mature plants with good vigor. This site was read in mid-September of 1988 and decadency numbers were likely inflated due to sagebrush dropping leaves in response to the dry conditions of that year. Trend for bitterbrush is slightly up due to an increase in the number of mature plants. Reproductive potential and percent young declined since 1988, but there are still sufficient seedlings and young to maintain the population. Average height and crown has also increased significantly. Overall browse trend is slightly up. The herbaceous understory trend is stable. Three of the five most numerous perennial grass species increased significantly, but the overall sum of nested frequency for perennial grasses declined slightly. Sum of nested frequency for perennial forbs increased significantly.

TREND ASSESSMENT
soil - slightly up (4)
browse - slightly up overall; up for mountain big sagebrush and slightly up for bitterbrush (4)
herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is stable. Bare ground doubled from 4% to 8%, but this is still comparatively low. Vegetation and litter cover remain high and are well disbursed over the site. Erosion remains minimal on this moderately steep site. Trend for browse is slightly down for mountain big sagebrush and stable for bitterbrush. Trend for mountain big sagebrush is slightly down due to the large increase in percent decadency from 19% to 47%. This increase is due to drought and should improve with better precipitation in the future. Although decadency increased, the proportion of the decadent plants classified as dying is low, and recruitment is currently adequate to replace this class of plants if any die-off occurs. Bitterbrush remains in mostly good vigor, decadency is low at 12% and use is not extreme. Trend for the herbaceous understory is slightly down overall. Although Kentucky bluegrass is the most abundant grass and increased in both cover and nested frequency in 2000, six other perennial grasses significantly decreased in nested frequency. Perennial forbs, while less abundant than grasses, declined in sum of nested frequency by nearly half.

TREND ASSESSMENT
soil - stable (3)
browse - stable overall; slightly down for mountain big sagebrush, stable for bitterbrush (3)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 9

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a53	b92	115	35	24	39	45	1.24	1.89
G	Agropyron spicatum	b97	ab70	a41	-	36	30	18	.84	1.12
G	Bromus tectorum (a)	-	b50	a3	-	-	18	1	.45	.00
G	Carex spp.	2	9	7	3	2	4	3	.17	.18
G	Koeleria cristata	c61	b5	a-	8	26	4	-	.02	-
G	Melica bulbosa	a27	b98	a43	7	10	40	16	1.87	.69
G	Poa fendleriana	a28	b92	a35	-	12	31	13	1.38	.92
G	Poa pratensis	a90	a140	b206	1	34	46	66	3.18	14.19
G	Poa secunda	c150	b75	a27	50	59	30	11	1.00	.22
G	Sitanion hystrix	b113	a33	a12	20	50	17	7	.35	.22
G	Stipa comata	c144	b57	a20	56	61	28	8	1.03	.80
G	Stipa lettermani	8	8	16	6	5	4	5	.21	.39
Total for Annual Grasses		0	50	3	0	0	18	1	0.45	0.00
Total for Perennial Grasses		773	679	522	168	319	273	192	11.33	20.68
Total for Grasses		773	729	525	168	319	291	193	11.79	20.68
F	Agoseris glauca	a-	b15	a3	-	-	6	1	.06	.00
F	Antennaria rosea	15	8	16	2	8	4	5	.48	.86
F	Arabis spp.	3	3	-	1	1	1	-	.00	-
F	Astragalus convallarius	1	11	12	-	1	4	5	.09	.39
F	Astragalus spp.	1	-	-	-	1	-	-	-	-
F	Castilleja linariaefolia	-	1	-	-	-	1	-	.06	-
F	Calochortus nuttallii	-	3	-	-	-	2	-	.01	-
F	Chaenactis douglasii	b13	a-	a1	-	6	-	1	-	.00
F	Collomia linearis (a)	-	b109	a-	-	-	43	-	.33	-
F	Comandra pallida	a-	b29	b25	-	-	14	12	.26	.18
F	Collinsia parviflora (a)	-	b252	a10	-	-	85	5	2.74	.02
F	Crepis acuminata	b8	b7	a-	-	5	3	-	.04	-
F	Cystopteris fragilis	4	-	-	-	2	-	-	-	-
F	Delphinium nuttallianum	-	6	-	-	-	2	-	.01	-
F	Descurainia pinnata (a)	-	2	-	-	-	1	-	.00	-
F	Erigeron eatonii	15	1	7	-	6	1	3	.00	.01
F	Eriogonum umbellatum	2	-	2	-	1	-	1	-	.00
F	Gayophytum ramosissimum (a)	-	3	-	-	-	1	-	.00	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Gilia spp.	-	-	-	1	-	-	-	-	-
F	Heterotheca villosa	$_{b}$84	$_{a}$51	$_{a}$40	12	37	22	19	1.01	.73
F	Ipomopsis aggregata	3	6	5	-	2	4	3	.02	.06
F	Lepidium densiflorum (a)	-	$_{b}$7	$_{a}$-	-	-	4	-	.02	-
F	Linum lewisii	-	3	-	-	-	1	-	.00	-
F	Lithospermum ruderale	4	1	1	-	2	1	1	.03	.00
F	Lomatium spp.	$_{a}$-	$_{b}$7	$_{a}$-	-	-	3	-	.02	-
F	Lupinus argenteus	$_{a}$-	$_{c}$38	$_{b}$11	-	-	19	6	.69	.10
F	Microsteris gracilis (a)	-	4	2	-	-	3	1	.01	.00
F	Orobanche spp.	-	5	-	-	-	2	-	.03	-
F	Penstemon spp.	3	-	-	-	2	-	-	-	-
F	Petradoria pumila	$_{b}$7	$_{a}$-	$_{a}$-	-	4	-	-	-	-
F	Phlox hoodii	-	2	3	-	-	1	1	.00	.15
F	Polygonum douglasii (a)	-	$_{b}$19	$_{a}$8	-	-	12	4	.06	.02
F	Sphaeralcea coccinea	24	17	13	-	13	8	6	.09	.20
F	Taraxacum officinale	$_{b}$17	$_{b}$16	$_{a}$-	-	9	8	-	.07	-
F	Tragopogon dubius	$_{b}$9	$_{a}$-	$_{a}$-	3	5	-	-	-	-
F	Trifolium gymnocarpon	$_{a}$-	$_{c}$29	$_{b}$6	-	-	13	3	.06	.04
F	Zigadenus paniculatus	-	2	4	-	-	1	2	.00	.06
Total for Annual Forbs		0	396	20	0	0	149	10	3.18	0.05
Total for Perennial Forbs		213	261	149	19	105	121	69	3.09	2.82
Total for Forbs		213	657	169	19	105	270	79	6.27	2.87

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 9

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	6	4	.03	.41
B	Artemisia tridentata vaseyana	91	82	15.07	16.77
B	Cercocarpus montanus	16	13	1.31	1.69
B	Chrysothamnus viscidiflorus lanceolatus	4	4	.18	.06
B	Eriogonum heracleoides	2	1	.18	-
B	Eriogonum microthecum	32	24	1.07	1.12

Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Gutierrezia sarothrae	6	0	-	-
B	Mahonia repens	2	0	-	-
B	Pinus edulis	0	4	1.74	2.24
B	Pinus ponderosa	0	0	.38	-
B	Purshia tridentata	51	56	7.84	9.34
B	Symphoricarpos oreophilus	16	15	1.53	2.60
B	Tetradymia canescens	0	1	-	-
Total for Browse		226	204	29.36	34.25

CANOPY COVER --
Herd unit 09 , Study no: 9

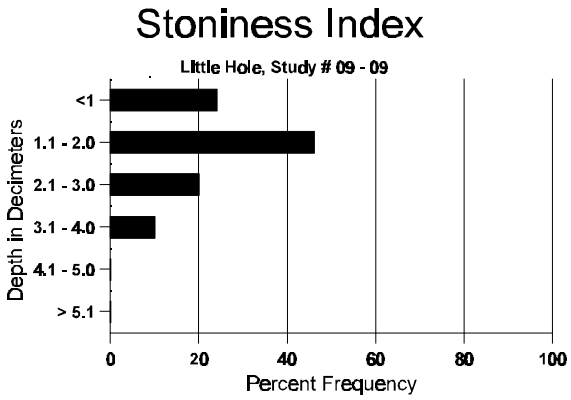
Species	Percent Cover '95	Percent Cover '00
Pinus edulis	-	2

BASIC COVER --
Herd unit 09 , Study no: 9

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '82	Average Cover % '88	Average Cover % '95	Average Cover % '00
Vegetation	357	337	8.75	12.25	52.22	56.11
Rock	112	89	6.00	12.50	8.00	5.73
Pavement	25	25	.25	.75	.20	.90
Litter	392	385	64.50	61.50	64.56	66.65
Cryptogams	91	63	5.00	4.25	1.27	1.97
Bare Ground	113	136	15.50	8.75	3.90	8.44

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 9, Study Name: Little Hole

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
12.52	59.6 (12.83)	6.2	64.4	18.0	20.6	2.6	6.4	153.6	0.5



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 9

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	4	13	278	N/A
Moose	1	1	26	2 (5)
Elk	4	3	78	6 (15)
Deer	15	12	365	28 (69)
Cattle	6	7	113	9 (22)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 9

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	2	-	-	-	-	-	-	-	-	-	1	1	-	40			2
M	82	-	1	-	-	-	-	-	-	-	1	-	-	-	33	27	22	1
	88	-	-	-	1	-	-	-	-	-	1	-	-	-	33	26	20	1
	95	3	2	-	-	-	-	-	-	-	2	1	2	-	100	29	38	5
	00	1	1	1	1	-	-	-	-	-	3	1	-	-	80	35	44	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	100%	00%	00%	+50%
'88	00%	00%	00%	+45%
'95	33%	00%	33%	+ 0%
'00	17%	17%	17%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	33		-
	'88	66		-
	'95	120		-
	'00	120		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	88	6	1	-	4	-	-	1	-	-	12	-	-	-	400			12
	95	13	1	-	-	-	-	-	-	-	14	-	-	-	280			14
	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
M	82	24	24	-	-	-	-	-	-	-	46	2	-	-	1600	17	23	48
	88	6	7	2	1	-	-	-	-	-	15	1	-	-	533	16	20	16
	95	74	76	1	6	-	-	-	-	-	157	-	-	-	3140	23	34	157
	00	72	1	-	7	-	-	-	-	-	80	-	-	-	1600	25	32	80
D	82	-	10	1	-	-	-	-	-	-	7	2	1	1	366			11
	88	40	37	1	1	-	-	-	-	-	75	-	-	4	2633			79
	95	16	19	4	1	-	-	-	-	-	32	-	-	8	800			40
	00	69	1	-	8	-	-	-	-	-	70	-	-	8	1560			78
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	600			30
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	500			25

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	57%	02%	03%	+44%
'88	42%	03%	04%	+15%
'95	45%	02%	04%	-21%
'00	01%	00%	05%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	1999	Dec:		18%
'88	3566			74%
'95	4220			19%
'00	3320			47%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	1	-	-	-	-	-	-	-	1	-	-	-	33			1
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	2	-	-	1	-	-	-	-	-	3	-	-	-	60			3
M	82	-	1	-	-	-	-	-	-	-	1	-	-	-	33	28	31	1
	88	-	-	1	-	-	-	-	-	-	1	-	-	-	33	22	31	1
	95	9	4	2	2	-	-	-	-	-	15	2	-	-	340	37	50	17
	00	3	-	1	1	4	1	-	-	-	7	-	3	-	200	35	49	10
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	1	-	-	-	1	-	-	-	20			1
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	100%	00%	00%	+50%
'88	50%	50%	00%	+83%
'95	21%	11%	00%	-26%
'00	29%	21%	21%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	33	Dec:	0%
	'88	66		0%
	'95	380		0%
	'00	280		7%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus lanceolatus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	11	-	-	-	-	-	-	-	-	11	-	-	-	220	16	19	11
	00	6	-	-	-	-	-	1	-	-	7	-	-	-	140	14	10	7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	-18%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	220		-
	'00	180		-

Eriogonum heracleoides																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40	7	19	2
	00	-	-	-	2	-	-	-	-	-	2	-	-	-	40	-	-	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+ 0%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	40		-
	'00	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum microthecum																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	7	-	-	1	-	-	-	-	-	7	-	1	-	266			8
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	3	-	-	2	-	-	-	-	-	5	-	-	-	100			5
M	82	6	-	-	-	-	-	-	-	-	5	-	1	-	200	9	8	6
	88	7	-	-	4	-	-	-	-	-	10	-	1	-	366	7	6	11
	95	95	-	-	-	-	-	-	-	-	95	-	-	-	1900	11	16	95
	00	30	1	-	10	-	-	8	-	-	49	-	-	-	980	9	11	49
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	17%	+73%
'88	00%	00%	09%	+63%
'95	00%	00%	00%	-44%
'00	02%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	200	Dec:	0%
	'88	732		14%
	'95	1960		0%
	'00	1100		2%

Gutierrezia sarothrae																		
M	82	8	-	-	-	-	-	-	-	-	8	-	-	-	266	9	6	8
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	166	7	6	5
	95	8	-	-	-	-	-	-	-	-	8	-	-	-	160	10	10	8
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	-38%
'88	00%	00%	00%	- 4%
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	266	Dec:	-
	'88	166		-
	'95	160		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Mahonia repens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	5	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	40		-
	'00	0		-

Opuntia spp.																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	5	-	-	1	-	-	-	-	-	5	-	1	-	200			6
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	7	-	-	-	-	-	-	-	-	7	-	-	-	233	6	9	7
	88	3	-	-	-	-	-	-	-	-	1	-	2	-	100	4	6	3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	7	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	22	0
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	30%
'95	00%	00%	00%
'00	00%	00%	00%

%Change
+30%

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	233	Dec:	0%
	'88	333		10%
	'95	0		0%
	'00	0		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	1	-	-	1	-	-	2	-	-	-	66			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	1	-	-	-	1	-	2	-	-	-	40	-	-	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+ 0%
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	33	Dec:		-
'88	33			-
'95	0			-
'00	80			-

Pinus ponderosa																		
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	88	2	-	-	2	-	-	-	-	-	4	-	-	-	133			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	33	41	69	1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+50%
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	66	Dec:		-
'88	133			-
'95	0			-
'00	0			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	7	-	-	1	-	-	4	-	-	12	-	-	-	400			12
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	88	26	5	-	5	-	-	3	-	-	38	-	1	-	1300			39
	95	5	6	-	4	-	-	-	-	-	15	-	-	-	300			15
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	82	6	4	-	-	-	-	-	-	-	10	-	-	-	333	22	32	10
	88	4	8	3	-	-	-	-	-	-	14	-	1	-	500	17	24	15
	95	30	37	-	5	1	-	-	-	-	73	-	-	-	1460	22	50	73
	00	24	4	3	19	1	13	-	-	-	62	-	2	-	1280	25	49	64
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	1	1	-	-	-	-	-	-	2	-	-	-	66			2
	95	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
	00	2	-	1	3	-	3	-	-	-	8	-	1	-	180			9
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	33%	00%	00%	+79%
'88	25%	07%	04%	- 5%
'95	49%	01%	00%	-13%
'00	06%	26%	04%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	399	Dec:	0%
	'88	1866		4%
	'95	1780		1%
	'00	1540		12%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	7	-	-	1	-	-	-	-	-	8	-	-	-	160			8
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	15	-	-	-	-	-	-	-	-	15	-	-	-	300	20	43	15
	00	14	-	-	8	-	-	1	-	-	23	-	-	-	460	12	28	23

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+12%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	0		-
	'88	0		-
	'95	460		-
	'00	520		-

Tetradymia canescens																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	22	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	17	24	1
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	0		0%
	'88	0		0%
	'95	0		0%
	'00	40		50%

Trend Study 9-10-00

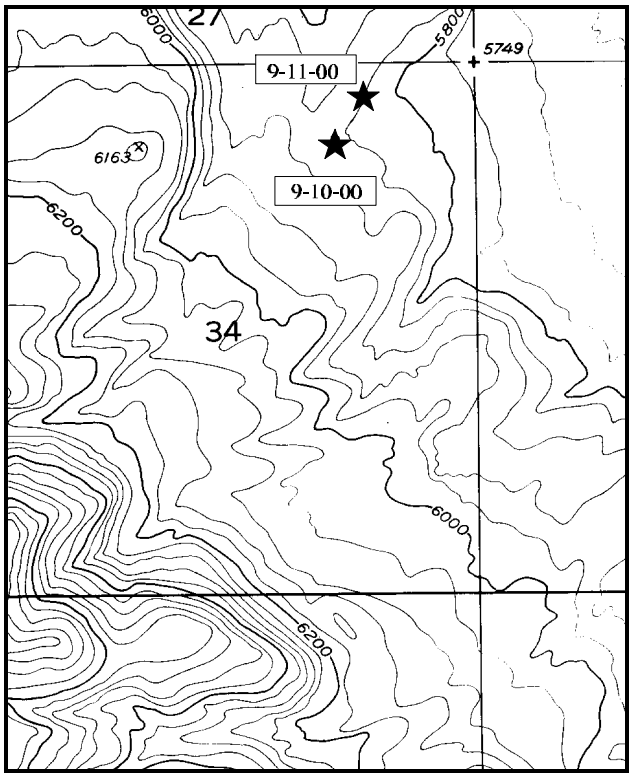
Study site name: Toliver Creek Chaining . Range type: Chained, Seeded P-J .

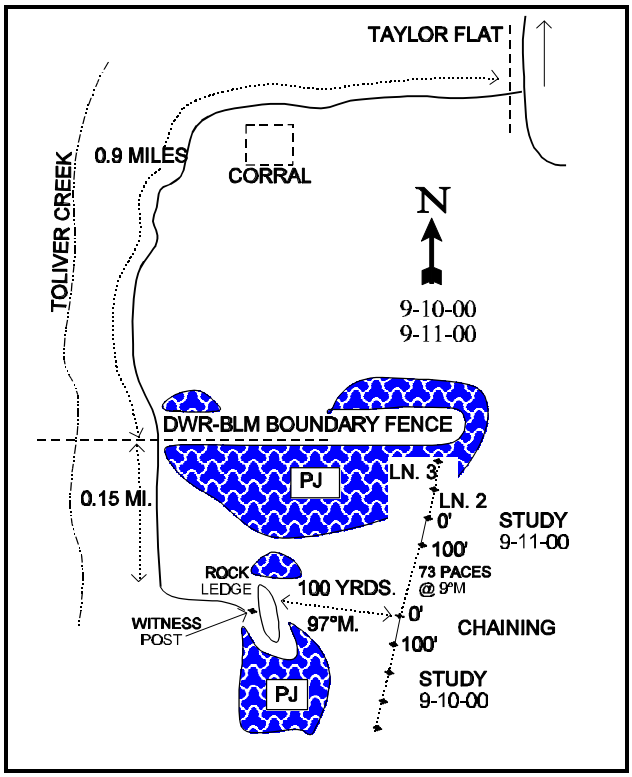
Compass bearing: frequency baseline 189°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

LOCATION DESCRIPTION

From the north side of the Green River at the Taylor Flat bridge, go south across the river 1.75 miles. Turn right and go through a gate. Go 0.2 miles to a gate by a corral. Continue south and west 0.7 miles to the DWR-BLM boundary fence. Go through the gate and continue 0.15 miles to the end of the road. There is a P-J covered, rocky ledge about 75 feet east. From the ledge, walk 60 paces SE into the chaining to a short green fencepost tagged #909 which marks the start of the frequency baseline.





Map Name: Warren Draw

Diagrammatic Sketch

Township 2N , Range 24E ,Section 34

UTM 4525857.827 N, 652611.654 E

DISCUSSION

Trend Study No. 9-10 (11-11)

The Toliver Creek Chaining study was established in 1988 to monitor a large pinyon-juniper chaining completed during the fall of 1986. It was two-way chained and seeded with grasses, forbs, and shrubs. This area is managed by the BLM and as with all of the Browns Park area, is considered critical deer winter range. Another study was established in the adjacent undisturbed pinyon-juniper stand to provide comparative baseline data for species composition and trend assessment. The study site is located in the foothills above Taylor Flat. The study site has a northern aspect with a slope of 3-4% and lies at an elevation of 5,900 feet. Animal use of the site appears light, although quadrat frequency of elk and deer pellets increased between 1995 and 2000. Pellet group transect data taken along the baseline in 2000 estimate 25 deer days use/acre (62 ddu/ha) and 7 elk days use/acre (17 edu/ha). Livestock use appears light as well with an estimated 2 cow days use/acre (5 cdu/ha) in 2000. This area is in the Taylor Flat allotment which is usually grazed in the spring from April 1 to May 31 for 1,000 AUM's.

The sandy loam soils are fairly shallow and extremely rocky. Estimated effective rooting depth is just over 7 inches, while penetrometer readings used to estimate a profile stoniness index showed nearly all probes hit rocks within the first 5 inches of the soil surface. Rock cover on the surface is high at 22%. Although rocky, this soil does support mountain big sagebrush suggesting that the rock here is of a cobbly nature and does not prohibit root penetration. Vegetation and litter cover have been adequate to prevent serious erosion, although both decreased in 2000 while bare ground increased. These changes in ground cover characteristics are due to drought. This should improve with better precipitation in the future.

Due to the shallow, rocky nature of the site, the control of pinyon and juniper by chaining was close to 100%. Few seedlings were observed and none were sampled in the density plots of 1988. Point-center quarter data from 2000 estimate 38 juniper and 12 pinyon trees/acre. Average diameter of juniper is 2.4 inches, while that of pinyon is only 1.5 inches. Fifteen percent of the juniper and 5% of the pinyon trees sampled consisted of live mature tipped trees which were not eradicated by the chaining treatment.

Browse are not abundant on the site with all species combining to contribute to just over 3% average cover in 2000. Mountain big sagebrush, fourwing saltbush, and rubber rabbitbrush do provide some forage. Currently, mountain big sagebrush density is estimated at 520 plants/acre, an increase from 380 plants/acre in 1995. Currently ('00), big sagebrush has good vigor, low decadency, and good recruitment from young plants at 12%. Use is light and average annual leader growth is 5 inches in 2000. Fourwing saltbush is estimated at 120 plants/acre in 2000 with the population consisting solely of mature plants. Use is light to moderate, vigor normal, with no decadent plants. Leader growth on fourwing averages 5 inches in 2000. Currently ('00), white-stemmed rubber rabbitbrush is estimated at 260 plants/acre, an increase from 60 plants/acre in 1995. Although this species is not always an important forage source, it is palatable to browsing animals and may be more important at this site due to the lack of a well developed shrub component. Use on rubber rabbitbrush is light, vigor good, and decadency is low at 8%.

Increaser species, including prickly pear and broom snakeweed, are present but only snakeweed has increased in abundance since 1988.

The herbaceous understory is limited. Cheatgrass is well established and was the dominant understory species in 1995. With drought conditions in 2000, cheatgrass is still abundant, but significantly decreased in nested and quadrat frequencies. Cheatgrass also has greatly reduced stature in 2000, resulting in a large decrease in average cover from 22% in 1995 to 4% in 2000. A good mix of seeded and native perennial grasses are present on the site, but most remain infrequent. Crested wheatgrass significantly increased in nested frequency between

1995 and 2000, and is currently ('00) the dominant grass. Crested wheatgrass was mostly dried up when the site was read in July of 2000. It exhibited moderate to heavy use. Average cover for crested wheatgrass, even with use, is presently estimated at nearly 10%. Other perennial grasses that have been sampled include: bluebunch wheatgrass, intermediate wheatgrass, orchard grass, needle-and-thread and Sandberg bluegrass. As a group, perennial grasses increased in sum of nested frequency in 2000 due mostly to the increase in crested wheatgrass. Forbs are scarce, especially in 2000 with drought. All forbs combined provide less than 1% average cover in 2000, a decrease from 4% in 1995. Annual forbs were nearly non-existent in 2000, while perennial forbs decreased in sum of nested frequency by 75%. Eighteen species of forbs were sampled in 1995, decreasing to only 6 in 2000.

1988 APPARENT TREND ASSESSMENT

Large rocks are prominent on the surface and account for 23% of the ground cover. Debris from the chaining provides a substantial amount of surface litter cover (54%). Percent bare ground is moderately high at 28%. Trend for soil appears stable at this time. There are low densities of shrubs on the site, but fourwing saltbush and mountain big sagebrush should increase in time. The herbaceous understory contains a good variety of seeded and native grasses although annual cheatgrass is currently the most abundant grass. Trend for grasses and forbs is improved from pre-chained conditions, however the abundance of annual grasses and forbs is a concern.

1995 TREND ASSESSMENT

Ground cover characteristics have improved since the chaining. Currently, there is only 5% bare soil and litter cover has remained moderately high at 54%. Trend for soil is up. The browse trend is improved for sagebrush and fourwing saltbush. One negative aspect is the increase of broom snakeweed which has increased 90% since 1988. However, the population appears to be stabilizing with a mostly mature plants and a much lower biotic potential (percent of seedlings to mature population). The herbaceous trend is down due to the dominance of annual grasses and forbs. Cheatgrass makes up 80% of the grass cover and 62% of the total vegetative cover. Annual forbs account for 39% of the forb cover. Drought conditions since 1987 have intensified this condition. Two perennial seeded grasses, crested and intermediate wheatgrass, did increase significantly in nested frequency since the last reading. These and other perennial grasses should eventually gain dominance of this site.

TREND ASSESSMENT
soil - up (5)
browse - improved but still in small numbers (4)
herbaceous understory - down due to the over dominance of annuals (1)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground increased from 5% to 22% and vegetation and litter cover both decreased. These changes in ground cover are due to drought and should reverse in the future with normal precipitation. Trend for browse is slightly up as mountain big sagebrush slightly increased in density, has good vigor and low decadency. Recruitment from young sagebrush plants is also good at 12%. Fourwing saltbush remains stable, even though no young plants were sampled in 2000. However, drought conditions make it difficult for young shrubs to establish and persist. Normal precipitation in the future will hopefully increase the number of young sagebrush and fourwing plants at this site, resulting in population increases. Trend for the herbaceous understory is slightly up as crested wheatgrass significantly increased in nested frequency, while cheatgrass significantly decreased in nested frequency. The understory is still limited and forbs are scarce.

TREND ASSESSMENT
soil - slightly down (2)
browse - slightly up (4)
herbaceous understory - slightly up (4)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 10

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron cristatum	a84	b165	c248	42	66	82	4.30	9.80
G	Agropyron intermedium	3	25	21	2	8	8	.55	.38
G	Agropyron spicatum	a-	a4	b25	-	2	9	.03	.17
G	Aristida purpurea	-	-	-	-	-	-	.03	-
G	Bromus tectorum (a)	b210	c363	a147	80	100	57	22.82	4.74
G	Dactylis glomerata	b73	a16	a22	33	8	13	.16	.71
G	Oryzopsis hymenoides	b17	a-	a2	8	-	1	-	.03
G	Poa secunda	11	1	6	5	1	2	.00	.01
G	Sitanion hystrix	b33	a-	a-	15	-	-	.00	-
G	Sporobolus cryptandrus	2	6	1	1	2	1	.01	.00
G	Stipa comata	a-	b20	b11	-	7	5	.69	.11
G	Unknown grass - perennial	b39	a-	a-	16	-	-	-	-
G	Vulpia octoflora (a)	-	b22	a4	-	8	2	.06	.01
Total for Annual Grasses		210	385	151	80	108	59	22.89	4.75
Total for Perennial Grasses		262	237	336	122	94	121	5.79	11.23
Total for Grasses		472	622	487	202	202	180	28.68	15.98
F	Calochortus nuttallii	a-	b5	a-	-	3	-	.01	-
F	Chenopodium album (a)	b7	a-	a-	5	-	-	-	-
F	Chenopodium spp. (a)	b22	a-	a-	11	-	-	-	-
F	Cymopterus longipes	a-	b3	ab4	-	3	2	.01	.01
F	Descurainia pinnata (a)	b19	b20	a-	11	8	-	.44	-
F	Draba reptans (a)	b7	c83	a-	4	31	-	.23	-
F	Erodium cicutarium (a)	-	b26	a6	-	9	2	.41	.01
F	Gilia spp. (a)	-	b18	a-	-	11	-	.05	-
F	Lappula occidentalis (a)	-	1	-	-	1	-	.00	-
F	Lactuca serriola	a-	b70	a-	-	35	-	.30	-
F	Lepidium densiflorum (a)	-	b7	a-	-	3	-	.01	-
F	Leucelene ericoides	37	40	24	19	19	11	.73	.18
F	Machaeranthera canescens	-	4	-	-	2	-	.01	-
F	Melilotus officinalis	-	7	-	-	2	-	.21	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Medicago sativa	$_{c}$24	$_{b}$9	$_{a}$-	13	3	-	.34	-
F	Phlox hoodii	-	6	1	-	2	1	.06	.00
F	Sanguisorba minor	$_{b}$5	$_{a}$-	$_{a}$-	3	-	-	-	-
F	Sisymbrium altissimum (a)	-	$_{b}$50	$_{a}$2	-	22	1	.48	.00
F	Sphaeralcea coccinea	$_{a}$-	$_{b}$23	$_{b}$13	-	10	6	.71	.05
F	Tragopogon dubius	$_{a}$-	$_{b}$6	$_{a}$-	-	3	-	.04	-
F	Unknown forb-annual (a)	$_{b}$7	$_{a}$-	$_{a}$-	3	-	-	-	-
F	Unknown forb-perennial	$_{b}$9	$_{ab}$3	$_{a}$-	4	1	-	.15	-
Total for Annual Forbs		62	205	8	34	85	3	1.64	0.01
Total for Perennial Forbs		75	176	42	39	83	20	2.59	0.24
Total for Forbs		137	381	50	73	168	23	4.24	0.26

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 10

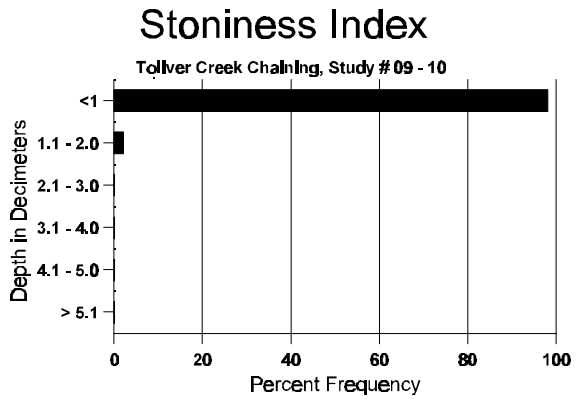
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata vaseyana	6	8	.33	.98
B	Atriplex canescens	5	5	.15	.66
B	Chrysothamnus depressus	0	3	-	.15
B	Chrysothamnus nauseosus hololeucus	3	5	.41	-
B	Chrysothamnus viscidiflorus viscidiflorus	0	1	-	-
B	Echinocereus spp.	0	1	-	-
B	Gutierrezia sarothrae	35	32	1.61	.38
B	Juniperus osteosperma	0	5	.96	.73
B	Opuntia spp.	21	27	.57	.25
B	Pinus edulis	0	1	-	-
Total for Browse		70	88	4.03	3.16

BASIC COVER --
Herd unit 09 , Study no: 10

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	376	320	3.00	38.45	21.76
Rock	268	270	12.25	22.84	22.35
Pavement	94	146	1.50	.37	1.22
Litter	392	353	54.75	54.20	42.52
Cryptogams	24	96	0	.09	1.69
Bare Ground	157	255	28.50	5.06	22.23

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 10, Study Name: Toliver Creek Chaining

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
7.39	68.8 (8.35)	7.3	69.4	17.0	13.6	4.5	14.3	288.0	0.9



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 10

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	18	35	244	N/A
Elk	7	23	87	7 (17)
Deer	12	13	339	26 (65)
Cattle	3	5	26	2 (5)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 10

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	6	-	-	-	-	-	6	-	-	-	120			6
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	1	-	-	-	-	-	-	-	-	-	1	-	-	33			1
	95	4	-	-	10	-	-	-	-	-	14	-	-	-	280			14
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	2	-	-	-	-	-	-	-	5	-	-	-	100	13	16	5
	00	22	-	-	-	-	-	-	-	-	22	-	-	-	440	14	18	22
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	+91%
'95	11%	00%	00%	+27%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	33	Dec:	0%
	'95	380		0%
	'00	520		4%

Atriplex canescens																		
S	88	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	6	-	-	-	-	-	-	-	-	6	-	-	-	120	27	36	6
	00	3	1	-	2	-	-	-	-	-	6	-	-	-	120	28	37	6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	+17%
'95	00%	00%	00%	-25%
'00	17%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	133	Dec:	-
	'95	160		-
	'00	120		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus depressus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	2	8	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'88	0	Dec:		-
'95	0			-
'00	60			-

Chrysothamnus nauseosus hololeucus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	33	11	8	1
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	28	31	3
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	34	44	3
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	+45%
'95	00%	00%	00%	+77%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'88	33	Dec:	0%
'95	60		0%
'00	260		8%

Chrysothamnus viscidiflorus viscidiflorus																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'88	0	Dec:	-
'95	0		-
'00	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Echinocereus spp.																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	3	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	6	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	20		-

Gutierrezia sarothrae																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	88	6	-	-	-	-	-	-	-	-	6	-	-	-	200	4	6	6
	95	91	-	-	-	-	-	-	-	-	91	-	-	-	1820	11	17	91
	00	95	-	-	-	-	-	-	-	-	50	2	43	-	1900	4	7	95
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	10	-	-	-	-	-	-	-	-	-	-	1	9	200			10
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	200			10

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	+90%
'95	00%	00%	00%	+ 9%
'00	00%	00%	50%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	200	Dec:	0%
	'95	1920		0%
	'00	2120		9%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	120		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	16	-	-	-	-	-	-	-	-	16	-	-	-	533			16
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	88	10	-	-	1	-	-	-	-	-	11	-	-	-	366	4	12	11
	95	27	-	-	-	-	-	-	-	-	27	-	-	-	540	3	12	27
	00	32	-	-	1	-	-	-	-	-	30	3	-	-	660	3	8	33
D	88	5	-	-	-	-	-	-	-	-	1	-	4	-	166			5
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	13%	-47%
'95	00%	00%	00%	+22%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	1065	Dec:	16%
	'95	560		0%
	'00	720		3%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	20		-

Trend Study 9-11-00

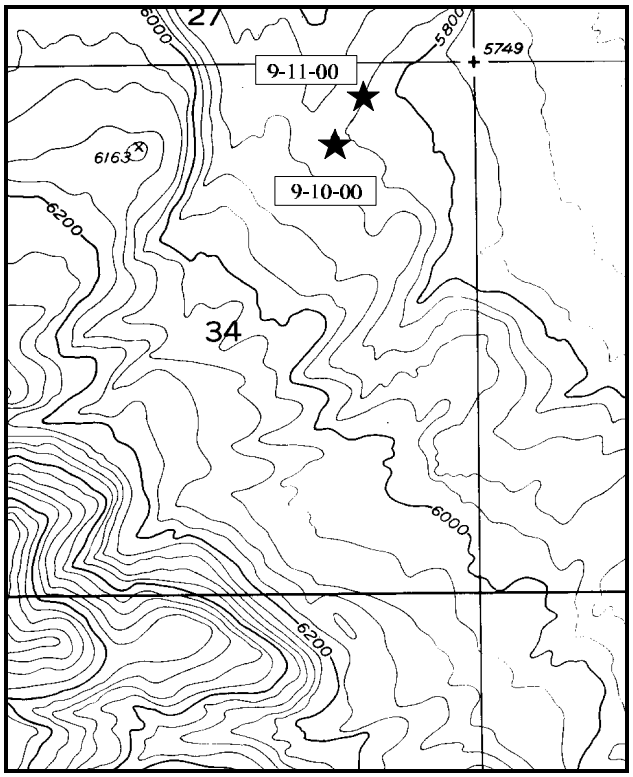
Study site name: Toliver Creek P-J . Range type: Pinyon-Juniper .

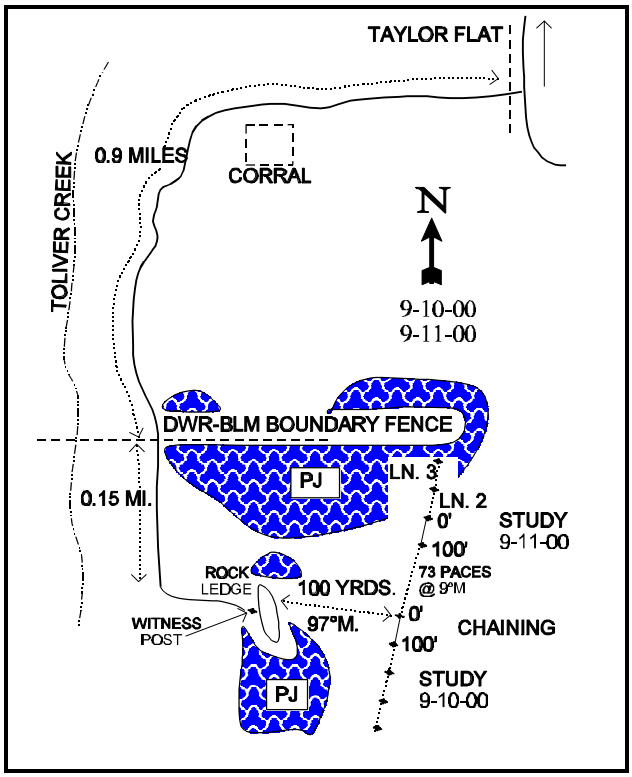
Compass bearing: frequency baseline 190°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

LOCATION DESCRIPTION

From the trend study in the Toliver Creek chaining, study #9-10-00, walk 73 paces north (9°M) into the unchained patch of juniper and pinyon. The first stake encountered should be the 100-foot baseline stake. The start of the frequency baseline is 100 feet north (9°M).





Map Name: Warren Draw Diagrammatic Sketch

Township 2N , Range 24E , Section 34

DISCUSSION

Trend Study No. 9-11 (11-12)

*** This site was not read in 2000, but text from the 1995 report is included. Refer to the 1995 "Utah Big Game Range Trend Studies" report for maps and data tables for this site.

The Toliver Creek Pinyon-Juniper trend study is located in a mature pinyon-juniper stand adjacent to the chaining treatment sampled by trend study 9-10. This site represents the situation on the chained site before treatment. This type provides necessary escape and thermal cover, but forage is very limited.

The study is on a west-facing, 5% slope at an elevation of 5,900. The land is managed by the BLM. The soil, being shallow and sandy, is similar to that found on the adjacent study site. One apparent difference is the prevalence of exposed sandstone slabs, as opposed to the smaller, rounded rocks on the chained site. There is considerable runoff due to the lack of understory and light litter cover.

Using line intercept to estimate tree canopy cover, the juniper and pinyon overstory covers approximately 41% of the ground surface. Tree density was estimated at 298 juniper trees/acre and 108 pinyon trees/acre using the point-centered quarter method. Average diameter of juniper is 12 inches while that of pinyon is 4.3 inches. Most of the junipers have been high-lined. The only other browse sampled was pricklypear cactus and broom snakeweed.

Annual grasses and forbs were not included in the 1988 sample. No perennial forbs were observed on the study site that year and the only perennial grass encountered was a few bottlebrush squirreltail. Data from 1995 show that this depleted understory totals to only 6% cover. It is dominated by annuals which account for 89% of the grass cover and 99% of the forb cover.

1988 APPARENT TREND ASSESSMENT

Due to the lack of understory, there is very little vegetative ground cover. The litter cover associated with the mature juniper and pinyon is insubstantial and does not provide much soil protection. Rock cover is a significant percentage of the total cover at 27%, with percent bare ground at 24%. This site is in poor condition but the soil trend appears stable. The site does not support any useful browse except pinyon and juniper, which are most useful as thermal and escape cover. The herbaceous understory is in poor condition and depleted.

1995 TREND ASSESSMENT

Conditions are still poor but have improved, likely due to the unusually wet spring this year. Percent bare ground has declined to only about 8%, while cover for cryptogams has increased to almost 7%. Trend for soil is slightly up but still in poor condition. The only browse which occurs on the site consists of cactus and broom snakeweed, both are useless as forage. The herbaceous understory is in poor condition and dominated by annuals but has improved slightly since the last reading.

TREND ASSESSMENT
soil - slightly up, but still in poor condition (4)
browse - no useful species present (1)
herbaceous understory - slightly improved, but in very poor condition with a poor composition (4)

Trend Study 9-12-00

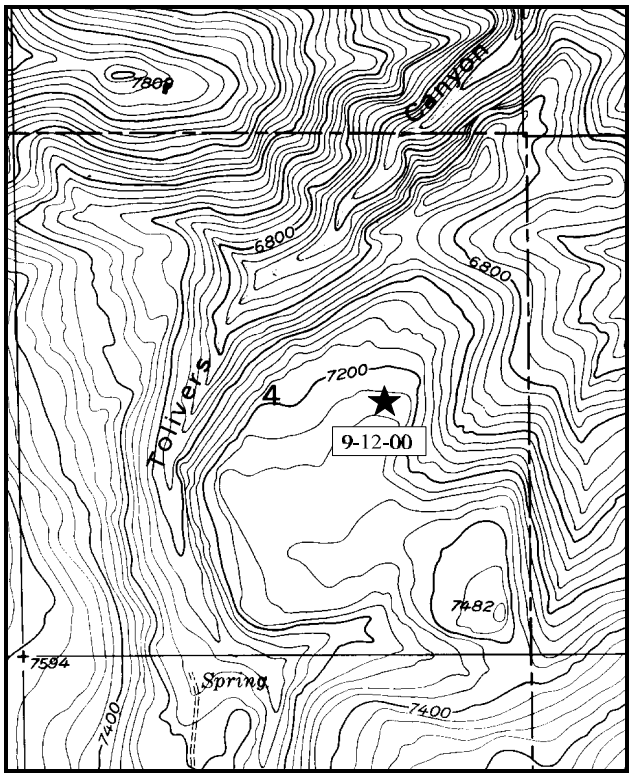
Study site name: Browns Park Burn & P-J . Range type: Pinyon-Juniper .

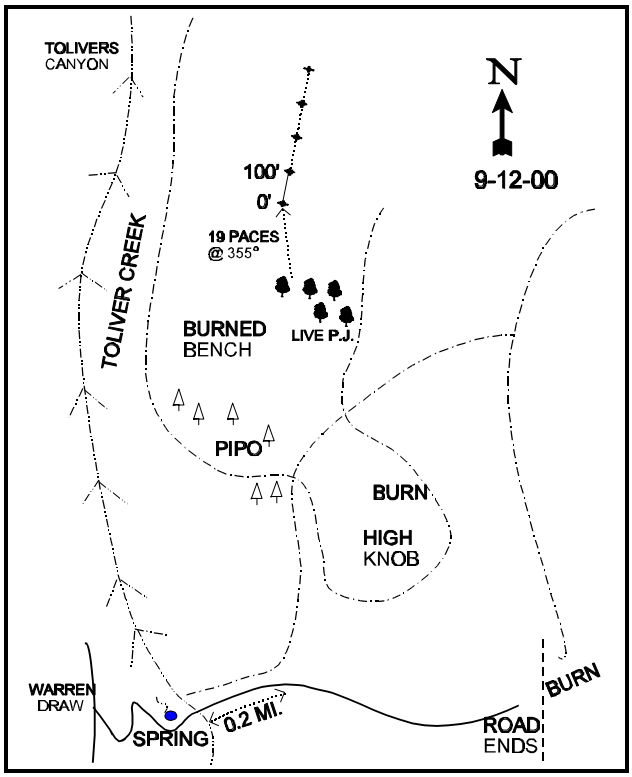
Compass bearing: frequency baseline 358°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

LOCATION DESCRIPTION

From the Warren Draw trend study, #9-7-00, proceed north 3.2 miles to a locked gate onto private land. Talk to the biologist for the key. Continue 1.9 miles to a fork by a stockpond, stay left. Go 0.45 miles to a fork, stay right. Continue another 0.45 miles, again bear right. Continue 0.4 miles down to the creek bottom. Proceed up the road for 0.2 miles, to a low point beneath the bench to the north. It is probably easiest to hike up to the bench from the low pass. Hike north, about ½ mile, over the top and down the burned bench. From the level ponderosa pine bench, continue north down the increasing slope where you will find the short green fencepost marking the burned P-J portion of the study.





Map Name: Warren Draw Diagrammatic Sketch

Township 1N , Range 24E ,Section 4 UTM 4523534.738 N, 651162.408 E

DISCUSSION

Trend Study No. 9-12 (11-13)

The Brown's Park P-J and Burn study samples a prescribed burn treatment that was conducted by the BLM in the upper Toliver Creek drainage in 1986. The treatment burned approximately 420 acres, containing several different range types; mixed mountain brush, Ponderosa pine, pinyon-juniper and curlleaf mountain mahogany. The trend study was established in the more prevalent pinyon-juniper/curlleaf mountain mahogany type. The study site is on a north facing slope of about 10-15% at an elevation of 7,200 feet. Abundant thermal and escape cover exists on areas surrounding the burn. Pellet group transect data taken along the baseline in 2000 show big game use to be light at the present time. Deer use is estimated at 5 days use/acre (12 ddu/ha) and elk use is estimated at 17 days use/acre (42 edu/ha). Livestock also graze the area with use being estimated at 12 cow days use/acre (30 cdu/ha) in 2000. According to BLM personnel, this area is grazed in conjunction with the Taylor Flat allotment, but the burned areas are only grazed 1 out of every 3 years.

The soil on this particular slope is moderately shallow with large rocks and boulders being prevalent on the surface. The soil itself is a coarse textured sandy loam with an estimated effective rooting depth of just over 10 inches. Nearly 80% of the penetrometer readings used to estimate a profile stoniness index hit rock within the upper 5 inches of the soil surface. The shallowness of penetrometer readings is the result of abundant bedrock being present over the site with a shallow layer of soil on top. Since the fire and the 1988 reading, there had been significant erosion due to the loss of duff and understory vegetation. Nearby unburned areas also showed serious erosion and soil loss due to the naturally sparse understory and runoff from surrounding bare areas. Initially, loss of the already shallow soil resulted in exposed plant roots and more rock. Erosion was not noted in 1995 due to the excellent protective ground cover from an improving understory. Rock cover has remained high at 27% in 1995 and 32% in 2000. Bare ground was estimated at 63% in 1988 declining to only 10% by 1995, and 12% in 2000. Litter cover increased from 7% to 47% by 1995, but slightly decreased to 42% in 2000. Vegetation cover has steadily increased with each reading as seeded grasses continue to increase on the site. Vegetation cover is currently ('00) estimated at 36%.

Unburned areas are dominated by an overstory of pinyon and juniper. Scattered curlleaf mountain mahogany, true mountain mahogany and snowberry occur in the understory. Tree species within the burn were completely killed by the fire, however many standing snags remain. Pre-burn pinyon density was estimated to be 467 trees/acre. The only browse encountered on the burn site in 1988 was sprouting mountain lover which numbered 333 plants/acre measuring only 4 x 3 inches. Currant and elderberry were also resprouting but were not encountered in the density plots. During the 1995 reading, several additional browse species were encountered including: serviceberry, manzanita, mountain big sagebrush, curlleaf mountain mahogany, true mountain mahogany, rubber rabbitbrush and snowberry. In 1995, all species were estimated at densities of 40 plants/acre or less, except for white-stemmed rubber rabbitbrush and snowberry which were estimated at 100 plants/acre and 80 plants/acre respectively. All species showed good vigor and light use in 1995. Browse continues to be low in abundance in 2000 with only rubber rabbitbrush, mountain lover and mahogany slightly increasing in density. Currently ('00), use remains light and vigor is good on all browse species.

Herbaceous vegetation was scarce in 1988 with few grasses and forbs appearing in the quadrats. No vegetation was hit with the points of the quadrats so there was no vegetation data estimated in 1988. Only annuals, mainly coyote tobacco (*Nicotiana attenuata*), were present. During the 1995 reading, 8 species of perennial grass and one sedge were encountered which combined to produce 16% cover. The site supports several native grasses including muttongrass, bluebunch wheatgrass, squirreltail, fescue, and a sedge. Seeded species including crested and intermediate wheatgrass, smooth brome, and orchard grass were also sampled. Crested wheatgrass is the dominate grass producing nearly 12% cover in 1995, increasing to 18% in 2000. Smooth brome is the second most numerous perennial grass which significantly increased in nested frequency in 2000. Quadrat frequency of

smooth brome also increased from 38 in 1995 to 71 in 2000, while cover increased from 2% to 9%. Both of these species have good vigor and provide good ground cover on this shallow soiled site. Cheatgrass was sampled in 1995 and was fairly abundant, contributing to over 3% cover and having a quadrat frequency of 49%. In 2000, cheatgrass was not sampled at all due to the extremely dry conditions. Forbs are infrequent especially in 2000 with drought. In 1995, ten species of perennial and 8 species of annual forbs were sampled. The number forbs sampled in 2000 decreased to 6 perennial and 3 annual species, with all species combining to provide just over 1% average cover. Sum of nested frequency for perennial grasses increased in 2000, while sum of nested frequency for perennial forbs slightly decreased from an already very low level.

1988 APPARENT TREND ASSESSMENT

With such a low density of living plants on the burn, no vegetative cover was sampled. The majority of the ground surface (63%) was bare soil. Rock and pavement cover was almost 30%. Litter was reduced by the fire, but it should recover to significant soil protection levels. Trend appears stable but in poor condition. Browse are lacking on the site but this should change over time. The herbaceous understory is sparse and needs time to become established.

1995 TREND ASSESSMENT

Ground cover characteristics have improved dramatically since 1988. Percent litter cover has increased from 7% to 47% while percent bare ground has declined from 63% to only 10%. Herbaceous vegetation has also increased significantly adding needed protective cover. Trend for soil is up. Browse are still lacking on the site but more species are coming in. Trend is up. The herbaceous understory has increased dramatically in sum of nested frequency. An additional 8 perennial species were encountered in 1995 with seeded crested wheatgrass and smooth brome being the most numerous. Sum of nested frequency of forbs also increased significantly. Trend for herbaceous understory is up.

TREND ASSESSMENT
soil - up (5)
browse - up but still not abundant (5)
herbaceous understory - up (5)

2000 TREND ASSESSMENT

Trend for soil is slightly up even though bare soil has increased from 10 to 12%. Vegetation cover increased significantly with the increase in crested wheatgrass and smooth brome. Cryptogamic cover also significantly increased from less than 1% in 1995 to over 8%. This provides additional important protective ground cover on this site which has shallow soils to begin with. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil increased from 3.2:1 to 5.5:1. Trend for browse is stable. Browse remains at low, but stable densities on the site. Use is light, and vigor is good on all species. Several years of normal or above normal precipitation is needed to provide favorable conditions for young shrubs to establish and be able to persist. Trend for the herbaceous understory is slightly up. The seeded grasses, crested wheatgrass and smooth brome, continue to increase in frequency. Both species have increased cover values which provide needed soil protection.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable (3)
herbaceous understory - slightly up (4)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 12

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron cristatum	a13	b269	b274	8	92	88	11.86	18.31
G	Agropyron intermedium	a-	b23	b32	-	8	12	.64	.28
G	Agropyron spicatum	-	3	-	-	1	-	.15	-
G	Bromus inermis	a-	b86	c207	-	38	71	2.09	9.42
G	Bromus tectorum (a)	-	b130	a-	-	49	-	3.29	-
G	Carex spp.	a-	b10	b6	-	4	3	.33	.09
G	Dactylis glomerata	a-	b10	b14	-	6	6	.49	.25
G	Festuca ovina	-	1	-	-	1	-	.03	-
G	Oryzopsis hymenoides	4	-	-	2	-	-	-	-
G	Poa fendleriana	a-	b17	b22	-	7	10	.11	.29
G	Sitanion hystrix	a-	b20	a4	-	8	2	.41	.03
Total for Annual Grasses		0	130	0	0	49	0	3.29	0
Total for Perennial Grasses		17	439	559	10	165	192	16.13	28.69
Total for Grasses		17	569	559	10	214	192	19.43	28.69
F	Agoseris glauca	-	-	1	-	-	1	-	.00
F	Allium spp.	a-	b18	a-	-	7	-	.04	-
F	Arabis spp.	a-	b14	c33	-	6	16	.03	.08
F	Balsamorhiza hookeri	-	3	-	-	2	-	.19	.00
F	Chenopodium album (a)	1	-	-	1	-	-	-	-
F	Collomia linearis (a)	-	4	-	-	2	-	.01	-
F	Collinsia parviflora (a)	-	12	-	-	8	-	.04	-
F	Crepis acuminata	a-	b7	a-	-	3	-	.21	-
F	Cymopterus longipes	a-	b11	b3	-	5	3	.05	.01
F	Descurainia pinnata (a)	a3	b105	a5	1	50	2	.30	.01
F	Erigeron spp.	a-	a5	b-	-	3	-	.05	-
F	Gayophytum ramosissimum (a)	-	b16	a-	-	8	-	.04	-
F	Heterotheca villosa	a-	a5	b17	-	2	6	.41	.89
F	Lappula occidentalis (a)	-	b6	a-	-	3	-	.01	-
F	Lactuca serriola	a-	b19	a-	-	8	-	.04	-
F	Melilotus officinalis	3	-	-	1	-	-	-	-
F	Microsteris gracilis (a)	-	b42	a3	-	16	1	.27	.00
F	Polygonum douglasii (a)	-	b9	a-	-	4	-	.02	-
F	Sisymbrium altissimum (a)	-	5	-	-	2	-	.01	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Taraxacum officinale	-	6	3	-	2	2	.03	.01
F	Tragopogon dubius	$_{a}$-	$_{a}$2	$_{b}$12	-	2	7	.04	.08
Total for Annual Forbs		4	199	8	2	93	3	0.71	0.01
Total for Perennial Forbs		3	90	69	1	40	35	1.10	1.10
Total for Forbs		7	289	77	3	133	38	1.81	1.12

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 12

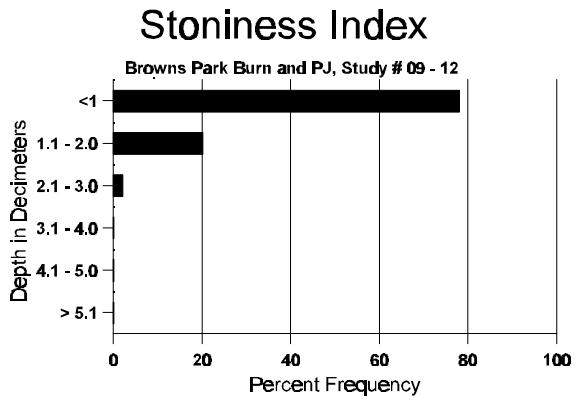
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Arctostaphylos uva-ursi	1	0	-	-
B	Cercocarpus ledifolius	2	2	.38	.88
B	Cercocarpus montanus	0	1	-	-
B	Chrysothamnus nauseosus hololeucus	5	6	.66	.66
B	Chrysothamnus viscidiflorus viscidiflorus	1	0	.00	-
B	Pachistima myrsinites	2	3	-	.03
B	Pinus edulis	0	2	-	-
B	Sambucus cerulea	1	1	.56	.03
B	Symphoricarpos oreophilus	3	2	.03	.53
Total for Browse		15	17	1.63	2.13

BASIC COVER --
Herd unit 09 , Study no: 12

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	331	349	0	23.90	36.50
Rock	310	297	28.00	27.12	32.09
Pavement	138	157	1.75	.41	2.28
Litter	390	362	7.00	46.50	41.93
Cryptogams	41	188	0	.36	8.36
Bare Ground	237	164	63.25	9.69	11.98

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 12, Study Name: Browns Park Burn and PJ

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.67	58.8 (32.8)	7.1	59.6	23.1	17.3	5.9	8.7	147.2	0.6



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 12

Type	Quadrat Frequency '95	Quadrat Frequency '00	Pellet Transect: Pellet Groups per Acre '00	Pellet Transect: Days Use per Acre (ha) '00
Rabbit	10	17	148	N/A
Elk	4	9	226	17 (43)
Deer	12	5	70	5 (13)
Cattle	2	1	148	12 (30)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 12

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	32	36	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

Artemisia tridentata vaseyana																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	18	34	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

Arctostaphylos uva-ursi																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	13	50	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	20		-
	'00	0		-

Cercocarpus ledifolius																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	23	34	2
	00	1	2	-	-	-	-	-	-	-	3	-	-	-	60	34	46	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'88	00%	00%	00%
'95	00%	00%	00%
'00	67%	00%	00%

%Change

+33%

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	40		-
	'00	60		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	41	50	0
	00	-	-	1	-	-	-	-	-	-	1	-	-	-	20	52	54	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	20		-

Chrysothamnus nauseosus hololeucus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	32	45	3
	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160	31	41	8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	+38%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	100		-
	'00	160		-

Chrysothamnus viscidiflorus viscidiflorus																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	11	16	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	20		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Mahonia repens																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	11	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pachistima myrsinites																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	88	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	88	6	-	-	-	-	-	-	-	-	6	-	-	-	200	4	3	6
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	6	22	2
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140	5	13	7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	-88%
'95	00%	00%	00%	+83%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	333	Dec:	-
	'95	40		-
	'00	240		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	40		-

Ribes cereum cereum																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	29	48	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	35	37	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

Sambucus cerulea																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	82	99	1
	00	-	-	-	-	-	-	-	1	-	1	-	-	-	20	95	106	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	+ 0%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	20		-
	'00	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	16	52	3
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	13	56	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	+ 0%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	80		-
	'00	80		-

Trend Study 9-13-00

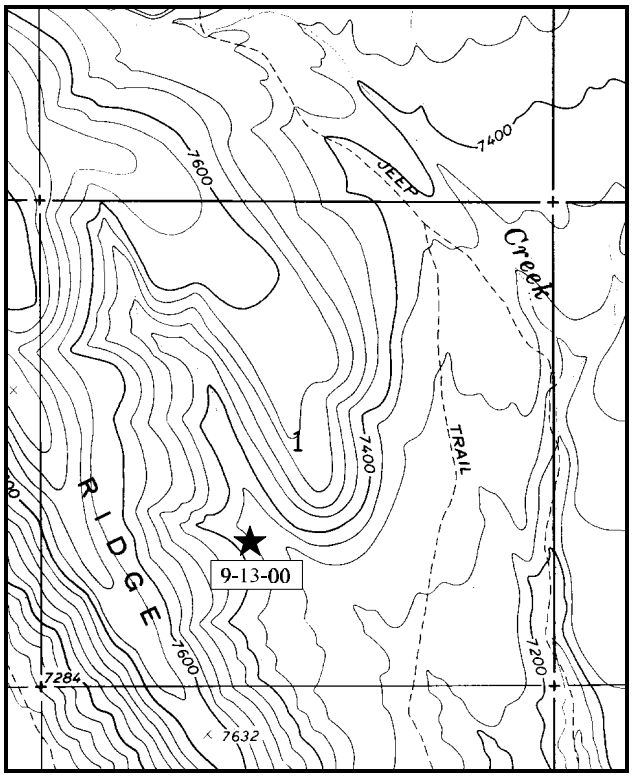
Study site name: John Starr Flat . Range type: Mixed Mountain Brush .

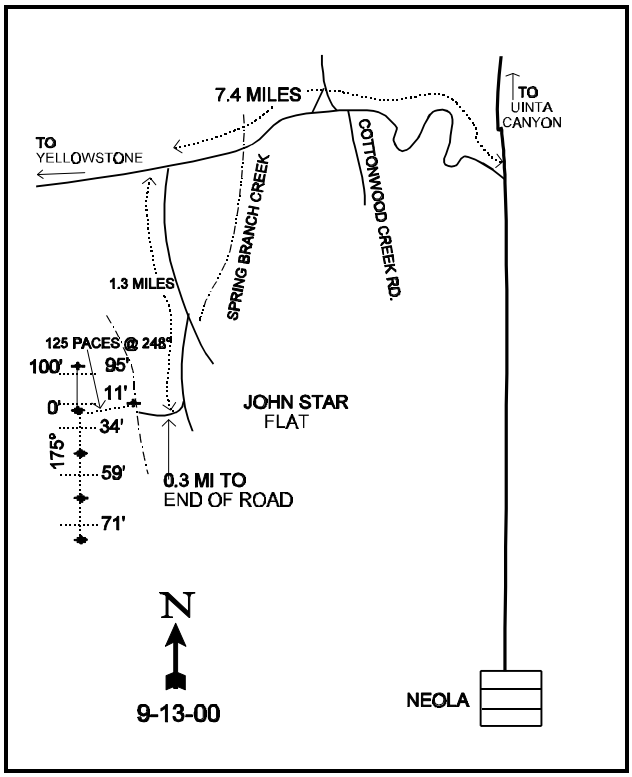
Compass bearing: frequency baseline 355°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Neola, drive north to a major fork. Turn left, west, (right fork goes to Uinta Canyon) and travel towards Yellowstone for 7.4 miles on the main road. At this point, turn left (south). Go 0.15 miles to a small fork and stay left. Continue 0.1miles to another fork and bear right. Proceed 1.1 miles to a major fork and continue on the right fork for 0.7 miles. At the next fork turn right towards the hills ti the west. Proceed 0.3 miles to the end of the road near a gully. From the end of the road, the 0-foot baseline stake is located 145 paces away at an azimuth of 245°M. The frequency baseline stakes are marked by green steel fenceposts approximately 18" in height. Browse tag #7020 is on the first baseline stake.





Map Name: Heller Lake

Diagrammatic Sketch

Township 1 N , Range 3W , Section 1

UTM 4484405.637 N, 569978.882 E

DISCUSSION

Trend Study No. 9-13 (12-1)

The John Starr Flat trend study is located at the northwest edge of John Starr Flat near the base of Tower Ridge. The area is within the Ute Indian Reservation and the study was established with assistance of a tribal biologist. The study site is on critical winter range for both deer and elk. Domestic livestock graze during the remainder of the year. The range type is mixed mountain brush on a northeasterly aspect with a 10% slope. Elevation is 7,400 feet. Pellet group data taken along the baseline in 2000 estimate moderate deer use at 46 days use/acre (114 ddu/ha) and light elk use at 20 days use/acre (50 edu/ha). No cattle pats were sampled.

These sandy loam soils are very rocky, but deep enough to support a dense mountain brush type. Effective rooting depth is estimated at a moderately shallow 7 inches, but with deep rooted shrub species on the site, the roots are obviously able to penetrate through the rocky profile. Phosphorus is low at 4.1 ppm as values less than 10 ppm may limit normal plant growth and development. Vegetation and litter cover are abundant enough to prevent severe erosion. Bare ground is moderate at an estimated 17% cover in 2000.

The key preferred browse species is true mountain mahogany which provided just over 10% average cover in 1995 and 2000. Estimated density was 2,866 plants/acre in 1982, increasing to 5,000 plants/acre in 1988, then declining to 3,580 in 1995. Large fluctuations in mahogany density are due to the change in sample size used after the 1988 reading which better estimates shrub population densities. Currently (‘00), true mountain mahogany is estimated at 3,260 plants/acre. Use is moderate to heavy in both 1995 and 2000, however percent decadency has been low at 1% and 6% during these years. Heavy use has increased with each reading and is currently (‘00) estimated at 64%. Heavy use may have been overestimated in 2000 as some plants displayed a hedged appearance due to low annual leader growth with the dry conditions. Mahogany vigor was normal in both 1982 and 1995, but declined somewhat in 1988 and 2000, both drought years. Twenty percent of the population had poor vigor in 1988, and 16% in 2000. Due to drought, many plants had a chlorotic appearance in 2000 and some had already begun to drop leaves. As a result, many were classified as having poor vigor. Recruitment has remained very good over all readings and is currently (‘00) estimated at 21%. Leader growth is low in 2000 averaging only 2 inches over the site.

Other key browse include: serviceberry, black sagebrush, mountain big sagebrush, bitterbrush and snowberry. The serviceberry population is estimated at 1,060 plants/acre in 2000. It shows an increase in decadency (0% to 11%) and poor vigor (0% to 17%). Heavy use also increased from 13% in 1995 to 45% in 2000. As with mahogany, use was difficult to determine due to low annual growth in 2000 due to drought. This can result in plants taking on a hedged appearance without necessarily experiencing a lot of use. Recruitment decreased from 28% to 15% in 2000, but this is still quite high. Serviceberry appear to be growing in close proximity to mahogany plants, which may provide some protection from browsing. Increases in decadency and poor vigor are likely drought related, and as with mahogany, some plants displayed a chlorotic appearance and were dropping leaves when the site was read in June of 2000.

Mountain big sagebrush is estimated at 1,520 plants/acre. It has moderately high decadency of 30%. Poor vigor has been estimated at 13% in both 1995 and 2000. Use is mostly light to moderate on sagebrush and recruitment is high at 18%. Mature plants were noted as being robust, vigorous and producing abundant seed in 2000. Black sagebrush is moderately abundant at an estimated 2,260 plants/acre in 2000. Use is light, decadency is moderate at 16% and poor vigor slightly increased in 2000. Pricklypear cactus is abundant on this site, currently estimated at 6,620 plants/acre.

The herbaceous understory accounts for 40% and 46% of the total vegetative cover in 1995 and 2000 respectively. Grasses are dominated by perennials including: needle-and-thread, bluebunch wheatgrass, a

Carex, Sandberg bluegrass and Indian ricegrass. Average cover contributed by grasses increased from 5% in 1995 to 14% in 2000. Sum of nested frequency of perennials increased in 2000 due mostly to the significant increase in needle-and-thread. Although cheatgrass is present, it is not abundant. In 2000, grasses are described as being robust and vigorous with little use. Forbs are especially diverse with 29 and 26 perennial species being sampled in 1995 and 2000 respectively. Perennial forb sum of nested frequency decreased in 2000 due to drought, but this decrease should turn around with normal precipitation in the future. Annual forbs were very abundant in 1995 with the wet spring of that year, but they were almost non-existent in 2000 with drought.

1982 APPARENT TREND ASSESSMENT

Range trend, both for soil and vegetation, appears stable to improving. Soil movement and loss are negligible. Vegetative and litter cover provide adequate soil protection. Vegetatively, the browse component appears healthy, although rather heavily utilized. However, stand maintenance and productivity seem assured under current levels of animal use. Grasses are vigorous, diverse and productive. No apparent problems are evident. Forb composition and productivity is somewhat deficient, but not seriously so.

1988 TREND ASSESSMENT

Soil trend appears stable with continued adequate protective ground cover. The browse trend is slightly up for the key preferred species true mountain mahogany. The number of mature plants declined slightly, but the number of seedlings and young increased dramatically. Percent decadence is still low at 8%, yet more shrubs display heavy use and poor vigor. Trend for the herbaceous understory is stable to slightly improving. Quadrat frequency of bluebunch wheatgrass, Sandberg bluegrass, and needle-and-thread increased while frequency of squirreltail, Indian ricegrass, and prairie Junegrass declined.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up for key species (4)
herbaceous understory - stable (3)

1995 TREND ASSESSMENT

Soil conditions are still stable with adequate protective ground cover. Trend for browse is slightly up for mahogany. Although total density declined from 5,000 plants/acre to 3,580, the number of mature plants increased. It should also be noted that 60% of the population in 1988 was classified as young plants and with the accompanying drought, many would have been lost. The much increased sample size would also account for some of the change in density. Percent decadency declined from 8% to 1% and vigor has improved. The only negative aspect is the increased heavy use (23% to 30%). A few bitterbrush were picked up in the larger sample used in 1995. Fifty percent of the mature plants were heavily hedged. Snowberry also showed more moderate to heavy use in 1995. Trend for the herbaceous understory is down for grasses and slightly up for forbs. Overall the trend is slightly down.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up for key species (4)
herbaceous understory - slightly down (2)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground slightly increased and the ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil decreased from 3.2:1 to 2.7:1. Erosion remains slight however. Trend for browse is stable. Poor vigor increased in the mahogany population, but this is due to drought and should improve with better precipitation in the future. Percent decadency is low (6%) and recruitment is high at 21%. The increase in heavy use may be overestimated due to low annual leader growth caused by drought in 2000. Serviceberry and mountain big sagebrush both show increased decadency and poor vigor, but as with mahogany, these increases are most likely drought related and should improve with normal precipitation. Recruitment is high for both of these species as well. Trend for the herbaceous understory is stable overall. Sum of nested frequency increased for perennial grasses, but decreased for perennial forbs. The loss of forb frequency is due to drought and will improve with normal precipitation.

TREND ASSESSMENT
soil - slightly down (2)
browse - stable (3)
herbaceous understory - stable overall; slightly up for grasses, slightly down for forbs (3)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 13

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron scribneri	-	-	-	4	-	-	-	-	-
G	Agropyron dasystachyum	-	-	-	4	-	-	-	-	-
G	Agropyron spicatum	$_{b}$125	$_{a}$67	$_{a}$73	29	53	29	30	.66	2.08
G	Bouteloua gracilis	12	4	9	1	6	2	5	.03	.33
G	Bromus tectorum (a)	-	$_{b}$61	$_{a}$14	-	-	21	7	1.28	.06
G	Carex spp.	93	110	94	30	43	45	37	1.67	3.58
G	Koeleria cristata	5	-	5	25	3	-	2	-	.30
G	Oryzopsis hymenoides	$_{a}$7	$_{ab}$21	$_{b}$24	20	3	7	13	.36	.78
G	Poa fendleriana	-	-	2	2	-	-	1	-	.00
G	Poa secunda	$_{c}$171	$_{a}$3	$_{b}$29	34	65	1	14	.00	.51
G	Sitanion hystrix	$_{b}$59	$_{a}$22	$_{a}$17	30	23	9	9	.18	.31
G	Stipa comata	$_{b}$175	$_{a}$76	$_{b}$132	47	70	36	54	.85	6.64
Total for Annual Grasses		0	61	14	0	0	21	7	1.28	0.06
Total for Perennial Grasses		647	303	385	226	266	129	165	3.77	14.57
Total for Grasses		647	364	399	226	266	150	172	5.05	14.64
F	Antennaria rosea	$_{b}$8	$_{a}$-	$_{a}$-	-	5	-	-	-	-
F	Arabis spp.	$_{a}$3	$_{b}$45	$_{a}$1	23	1	17	1	.16	.00
F	Arenaria congesta	-	-	1	8	-	-	1	-	.00
F	Artemisia ludoviciana	6	21	17	3	3	9	7	.15	.28
F	Astragalus convallarius	7	6	1	-	4	2	1	.04	.01
F	Astragalus spatulatus	2	1	-	1	1	1	-	.03	-
F	Balsamorhiza hookeri	155	123	117	45	69	56	58	1.11	2.79

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Castilleja linariaefolia	$_{a}$-	$_{b}$26	$_{a}$2	-	-	12	1	.13	.03
F	Calochortus nuttallii	6	3	3	8	4	1	1	.00	.00
F	Chenopodium leptophyllum (a)	$_{b}$-	$_{a}$22	7	-	-	10	4	.05	.02
F	Collomia linearis (a)	-	$_{b}$133	$_{a}$1	-	-	61	1	.80	.00
F	Comandra pallida	$_{b}$43	$_{a}$13	$_{b}$34	10	18	8	17	.14	.32
F	Crepis acuminata	-	4	1	-	-	2	1	.03	.00
F	Cryptantha spp.	$_{a}$15	$_{b}$37	$_{a}$3	33	8	20	1	.27	.03
F	Cymopterus longipes	7	6	9	1	5	4	4	.02	.09
F	Descurainia pinnata (a)	-	$_{b}$19	$_{a}$-	-	-	8	-	.04	-
F	Draba spp. (a)	-	$_{b}$58	$_{a}$-	-	-	22	-	.11	-
F	Erigeron flagellaris	$_{b}$21	$_{ab}$14	$_{a}$4	-	11	5	1	.02	.03
F	Erigeron pumilus	2	12	17	3	2	6	8	.03	.19
F	Eriogonum umbellatum	5	13	9	3	4	7	5	.08	.10
F	Helianthella microcephala	58	76	76	33	28	33	36	1.40	1.12
F	Heuchera parvifolia	4	5	-	-	1	3	-	.01	-
F	Hymenoxys acaulis	-	1	-	5	-	1	-	.00	-
F	Lappula occidentalis (a)	-	$_{b}$104	$_{a}$2	-	-	43	1	.51	.00
F	Lepidium densiflorum (a)	-	$_{b}$174	$_{a}$-	-	-	65	-	1.28	-
F	Linum lewisii	-	5	-	-	-	2	-	.01	-
F	Lithospermum ruderale	$_{b}$15	$_{a}$3	$_{a}$1	4	7	2	1	.04	.03
F	Lychnis drummondii	3	3	-	-	1	1	-	.03	-
F	Machaeranthera grindelioides	14	18	24	-	8	7	12	.39	.73
F	Orobanche spp.	-	3	-	-	-	1	-	.00	-
F	Penstemon caespitosus	$_{b}$12	$_{a}$-	$_{a}$1	-	5	-	1	-	.00
F	Penstemon humilis	35	14	-	38	18	9	-	.09	-
F	Petradoria pumila	46	60	57	18	20	21	22	1.45	3.11
F	Phlox longifolia	$_{b}$72	$_{ab}$51	$_{a}$30	13	33	23	17	.19	.18
F	Polygonum douglasii (a)	-	$_{b}$79	$_{a}$1	-	-	35	1	.35	.00
F	Schoencrambe linifolia	$_{a}$-	$_{c}$57	$_{b}$7	-	-	26	3	.43	.01
F	Sedum lanceolatum	$_{b}$55	$_{a}$22	$_{a}$14	14	22	13	6	.16	.05
F	Senecio multilobatus	8	3	2	-	5	1	1	.63	.00
F	Sphaeralcea coccinea	12	21	10	5	7	11	5	.19	.39
F	Tragopogon dubius	4	-	3	-	2	-	1	-	.00
F	Zigadenus elegans	$_{a}$-	$_{b}$12	$_{b}$10	-	-	5	6	.02	.05
Total for Annual Forbs		0	589	11	0	0	244	7	3.15	0.03
Total for Perennial Forbs		618	678	454	268	292	309	218	7.33	9.62
Total for Forbs		618	1267	465	268	292	553	225	10.48	9.66

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 13

Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Amelanchier utahensis	20	35	1.33	5.81
B	Artemisia frigida	0	8	-	.06
B	Artemisia nova	38	40	1.24	2.92
B	Artemisia tridentata vaseyana	38	41	5.35	3.95
B	Cercocarpus montanus	85	80	10.75	10.21
B	Chrysothamnus depressus	3	2	.06	.03
B	Chrysothamnus nauseosus graveolens	0	1	-	-
B	Chrysothamnus viscidiflorus lanceolatus	12	12	.68	.39
B	Eriogonum corymbosum	1	0	-	.00
B	Gutierrezia sarothrae	12	8	.56	.40
B	Juniperus osteosperma	0	2	.85	1.00
B	Opuntia fragilis	72	68	1.28	1.51
B	Pediocactus simpsonii	2	9	-	.00
B	Pinus edulis	0	1	.00	-
B	Purshia tridentata	9	5	.49	.36
B	Symphoricarpos oreophilus	9	15	.45	1.88
B	Tetradymia canescens	5	2	-	.03
Total for Browse		306	329	23.08	28.61

CANOPY COVER --
Herd unit 09 , Study no: 13

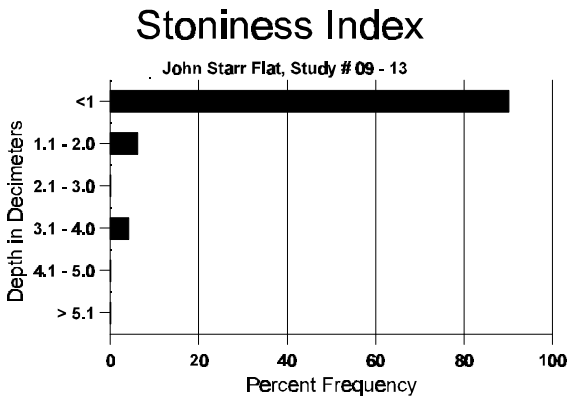
Species	Percent Cover '00
Juniperus osteosperma	2

BASIC COVER --
Herd unit 09 , Study no: 13

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '82	Average Cover % '88	Average Cover % '95	Average Cover % '00
Vegetation	351	323	12.50	7.50	41.08	48.65
Rock	214	193	2.00	4.75	9.96	12.08
Pavement	137	202	2.50	2.50	1.25	4.17
Litter	393	373	69.50	68.75	46.87	46.81
Cryptogams	15	28	.75	.75	.23	.21
Bare Ground	239	273	12.75	15.75	13.88	17.58

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 13, Study Name: John Starr Flat

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
7.64	60.4 (9.13)	6.7	67.4	16.0	16.6	3.8	4.1	134.4	0.8



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 13

Type	Quadrat Frequency '95	Quadrat Frequency '00	Pellet Transect: Pellet Groups per Acre '00	Pellet Transect: Days Use per Acre (ha) '00
Rabbit	8	21	287	N/A
Elk	10	15	261	20 (50)
Deer	23	19	600	46 (114)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 13

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	2	-	2	-	-	-	-	-	5	-	-	-	333			5
	95	8	-	-	1	-	-	-	-	-	9	-	-	-	180			9
	00	7	1	-	-	-	-	-	-	-	3	5	-	-	160			8
M	82	-	5	-	-	-	-	-	-	-	2	3	-	-	333	24	24	5
	88	-	2	1	-	-	-	-	-	-	2	1	-	-	200	26	25	3
	95	-	4	3	6	9	1	-	-	-	23	-	-	-	460	24	32	23
	00	1	4	6	2	7	15	4	-	-	29	3	7	-	780	32	37	39
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	3	3	-	-	-	-	-	-	3	1	-	2	120			6
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	100%	00%	00%	+38%
'88	50%	13%	00%	+17%
'95	41%	13%	00%	+40%
'00	28%	45%	17%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	333	Dec:		0%
'88	533			0%
'95	640			0%
'00	1060			11%

Artemisia frigida																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	11	-	-	-	-	-	-	-	-	11	-	-	-	220	9	11	11

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	0	Dec:	-
'88	0		-
'95	0		-
'00	220		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
S	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	88	3	-	-	1	-	-	-	-	-	4	-	-	-	266			4
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
	00	13	-	-	-	-	-	-	-	-	13	-	-	-	260			13
Y	82	3	2	-	-	-	-	-	-	-	5	-	-	-	333			5
	88	14	1	1	2	-	-	-	-	-	17	-	1	-	1200			18
	95	6	7	-	-	-	-	-	-	-	13	-	-	-	260			13
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	82	12	14	-	-	-	-	-	-	-	13	13	-	-	1733	12	17	26
	88	19	5	-	1	-	-	-	-	-	22	2	1	-	1666	14	15	25
	95	18	30	10	1	3	-	-	-	-	62	-	-	-	1240	9	15	62
	00	79	5	4	1	1	-	-	-	-	90	-	-	-	1800	9	15	90
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	13	5	-	1	-	-	-	-	-	16	-	2	1	1266			19
	95	1	-	2	-	-	-	-	-	-	2	-	-	1	60			3
	00	17	-	-	1	-	-	-	-	-	9	-	-	9	360			18
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	52%	00%	00%	+50%
'88	18%	02%	08%	-62%
'95	51%	15%	01%	+31%
'00	05%	04%	08%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	2066		0%
	'88	4132		31%
	'95	1560		4%
	'00	2260		16%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	1	-	-	-	-	-	2	-	-	-	133			2
	95	15	-	-	-	-	-	-	-	-	15	-	-	-	300			15
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	95	9	5	1	-	-	-	-	-	-	14	-	-	1	300			15
	00	14	-	-	-	-	-	-	-	-	14	-	-	-	280			14
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	8	22	7	2	1	-	-	-	-	40	-	-	-	800	21	33	40
	00	21	14	2	1	1	-	-	-	-	39	-	-	-	780	26	29	39
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	4	6	4	-	-	-	-	-	-	6	-	-	8	280			14
	00	16	5	2	-	-	-	-	-	-	13	-	3	7	460			23
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	180			9
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	+81%
'95	49%	17%	13%	+ 9%
'00	26%	05%	13%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	0%
	'88	266		25%
	'95	1380		20%
	'00	1520		30%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	8	1	-	1	-	-	2	-	-	11	-	1	-	800			12
	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	6	3	-	-	-	-	-	-	-	9	-	-	-	600			9
	88	23	17	4	1	-	-	-	-	-	39	-	6	-	3000			45
	95	11	22	4	-	2	-	-	-	-	39	-	-	-	780			39
	00	16	14	5	-	-	-	-	-	-	34	1	-	-	700			35
M	82	6	23	3	-	-	-	-	-	-	27	5	-	-	2133	21	27	32
	88	2	11	10	-	-	1	-	-	-	17	-	7	-	1600	30	36	24
	95	6	28	41	2	55	6	-	-	-	138	-	-	-	2760	27	38	138
	00	3	11	24	1	10	70	-	-	-	92	5	22	-	2380	27	39	119
D	82	-	2	-	-	-	-	-	-	-	-	2	-	-	133			2
	88	-	4	2	-	-	-	-	-	-	4	-	2	-	400			6
	95	-	-	2	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	3	4	-	-	2	-	-	-	5	-	2	2	180			9
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	65%	07%	00%	+43%
'88	43%	23%	20%	-28%
'95	60%	30%	00%	- 9%
'00	23%	64%	16%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	2866	Dec:	5%
	'88	5000		8%
	'95	3580		1%
	'00	3260		6%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus depressus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	3	-	-	1	-	-	-	-	-	4	-	-	-	266	4	6	4
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	7	13	3
	00	1	-	2	-	-	-	-	-	-	3	-	-	-	60	7	13	3
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	-82%
'95	00%	00%	00%	+ 0%
'00	00%	67%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	0%
	'88	332		20%
	'95	60		0%
	'00	60		0%

Chrysothamnus nauseosus graveolens																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	3	-	-	-	3	-	-	-	60	-	-	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	60		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus lanceolatus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	16	-	1	2	-	-	-	-	-	19	-	-	-	380	14	17	19
	00	15	1	-	-	-	-	-	-	-	10	6	-	-	320	14	21	16
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	05%	00%	-20%
'00	06%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	400		-
	'00	320		-

Eriogonum corymbosum																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	20		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	9	9	1
	88	10	-	-	-	-	-	1	-	-	10	-	1	-	733	8	6	11
	95	19	-	-	-	-	-	-	-	-	19	-	-	-	380	10	11	19
	00	42	-	-	-	-	-	-	-	-	42	-	-	-	840	6	8	42
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+92%
'88	00%	00%	08%	-50%
'95	00%	00%	00%	+55%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	66	Dec:	0%
	'88	799		8%
	'95	400		5%
	'00	880		5%

Juniperus osteosperma																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	47	39	1
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	53	55	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+ 0%
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	66	Dec:	-
	'88	66		-
	'95	0		-
	'00	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia fragilis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	21	-	-	1	-	-	1	-	-	23	-	-	-	1533			23
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	50	-	-	1	-	-	12	-	-	63	-	-	-	4200			63
	95	29	-	-	-	-	-	-	-	-	29	-	-	-	580			29
	00	14	-	-	-	-	-	-	-	-	14	-	-	-	280			14
M	82	35	-	-	-	-	-	-	-	-	35	-	-	-	2333	2	7	35
	88	83	-	-	1	-	-	6	-	-	83	-	6	1	6000	2	6	90
	95	243	-	-	-	-	-	-	-	-	243	-	-	-	4860	3	8	243
	00	308	1	-	-	-	-	-	-	-	309	-	-	-	6180	2	6	309
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	29	-	-	-	-	-	-	-	-	18	-	5	6	1933			29
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	8	-	-	-	-	-	-	-	-	6	-	-	2	160			8
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+81%
'88	00%	00%	10%	-55%
'95	00%	00%	00%	+18%
'00	.30%	00%	.60%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	2333	Dec:	0%
	'88	12133		16%
	'95	5440		0%
	'00	6620		2%

Pediocactus simpsonii																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	2	3	2
	00	15	-	-	-	-	-	-	-	-	15	-	-	-	300	2	3	15

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+87%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	40		-
	'00	300		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	66		-
	'95	0		-
	'00	20		-

Purshia tridentata																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	2	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	3	6	2	-	-	-	-	-	12	-	-	-	240	17	31	12
	00	1	2	2	-	-	4	-	-	-	9	-	-	-	180	17	40	9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	36%	43%	00%
'00	22%	67%	00%

%Change

-36%

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	280		-
	'00	180		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	15	-	-	-	-	-	-	-	-	15	-	-	-	1000			15
	88	11	-	-	1	-	-	1	-	-	9	-	4	-	866			13
	95	1	2	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	5	1	-	-	-	-	-	-	-	6	-	-	-	120			6
M	82	6	-	-	-	-	-	-	-	-	6	-	-	-	400	7	4	6
	88	1	-	-	1	-	-	2	-	-	3	-	1	-	266	9	14	4
	95	5	1	2	5	-	-	-	-	-	13	-	-	-	260	13	26	13
	00	34	-	-	-	-	-	3	-	-	37	-	-	-	740	8	16	37

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	-19%
'88	00%	00%	29%	-72%
'95	19%	13%	00%	+63%
'00	02%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	1400	Dec:	-
	'88	1132		-
	'95	320		-
	'00	860		-

Tetradymia canescens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	1	-	-	-	-	1	-	-	2	-	-	-	133			2
	95	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	3	1	-	-	-	-	-	-	1	2	1	-	266	13	14	4
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	7	10	1
	95	-	4	1	1	-	-	-	-	-	6	-	-	-	120	9	13	6
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	16	17	0
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	1	1	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	75%	25%	25%	-25%
'88	33%	00%	00%	-20%
'95	63%	25%	00%	-75%
'00	50%	50%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	266	Dec:	0%
	'88	199		0%
	'95	160		13%
	'00	40		100%

Trend Study 9-14-00

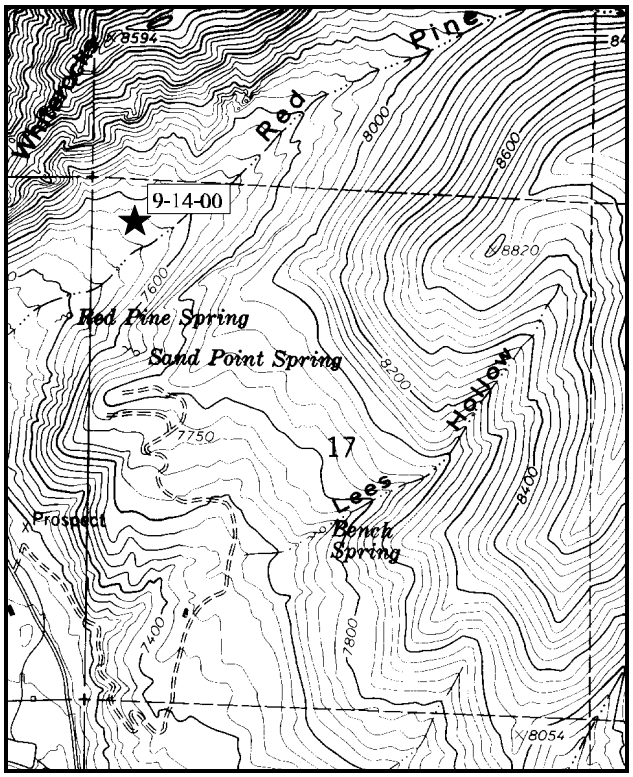
Study site name: Red Pine Canyon . Range type: Mixed Mountain Brush .

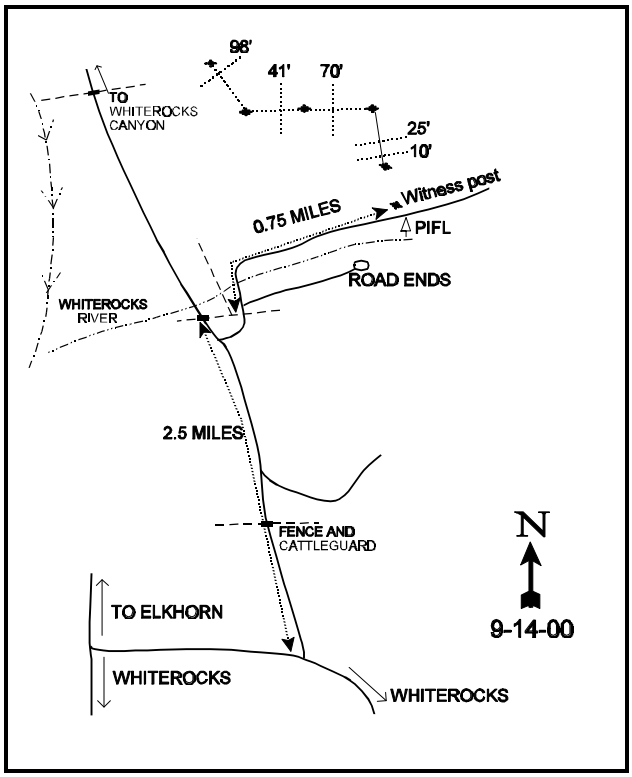
Compass bearing: frequency baseline 340°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (10 & 25ft), line 2 (70ft), line 3 (41ft), line 4 (98ft).

LOCATION DESCRIPTION

From the town of Whiterocks, go east 1.75 miles to a "T" intersection. Turn left and proceed north approximately 4.5 miles to the point where the road makes a sharp bend to the west. Just after the bend, turn north onto the Whiterocks Canyon Road. Proceed approximately 2.6 miles to a dirt road to the east. Turn right, before the cattle guard. Follow the road along the fence, cross the creek then bear right and go up the canyon about 0.75 miles to a witness post on the left side of the road. A lone limber pine is near the witness post on the right side of the road. From the witness post, the 0-foot baseline stake is located 6 paces away at a bearing of 300°M. The 0-foot stake is marked with a browse tag #9038. The frequency baseline stakes are marked by green fenceposts 12-18 inches in height.





Map Name: Ice Cave Peak Diagrammatic Sketch

Township 2N Range 1W , Section 17 UTM 4492156.525 N, 591955.356 E

DISCUSSION

Trend Study No. 9-14 (12-3)

The Red Pine Canyon study is located in the Whiterocks River drainage on the north side of Red Pine Canyon. The area is within the Ashley National Forest and is considered critical winter range for deer and elk in most years. The study site is on a southerly exposure with a 10% to 12% slope at an elevation of 7,300 feet. Pellet group transect data taken along the baseline in 2000 estimate 33 deer days use/acre (81 ddu/ha), 2 elk days use/acre (5 edu/ha), and 1 cow day use/acre (3 cdu/ha). Rabbit pellets were the most abundant category in the pellet transect. Two deer were observed on the site when it was read in 2000. Thermal and escape cover are abundant with tall trees and shrubs in all directions.

Soils on the site are alluvially derived and not well consolidated in recognizable horizons. Soil texture is a sandy loam and moderately deep with an estimated effective rooting depth of nearly 14 inches. Large boulders and cobbles are present on the surface and throughout the profile. The soil appears highly erodible but currently is in good condition due primarily to abundance of vegetation and litter. Bare ground is low at 5%, with most occurring in open spaces underneath the shrub canopy. A few inactive gullies are present on the site with estimated depths of about 6 feet.

Shrubs dominate the site providing 74% of the vegetation cover. Key browse species include mountain big sagebrush and antelope bitterbrush, with lesser numbers of serviceberry and true mountain mahogany. Mountain big sagebrush averages around 20% cover in 1995 and 2000. It provides nearly half the shrub cover at the site. Density was estimated at 3,199 plants/acre for mountain big sagebrush in 1982, increasing to 4,332 by 1988. With the much larger sampled used in 1995, density was estimated at 2,640 plants/acre in 1995 and 2,360 in 2000. The larger sample better estimates shrub densities that are characteristically clumped and/or have discontinuous distributions. Young plants comprised over 30% of the population in 1982 and 1988, but were apparently overestimated with the small sample used in those earlier years. Recruitment is currently (‘00) low at 1%. Utilization has generally been light with percent decadency ranging between 8% in 1982 to 19% in 2000. This level is not unreasonable for sagebrush. The proportion of the plants classified with poor vigor is estimated at 8% in both 1995 and 2000. This is an overly mature, dense population that would improve with thinning.

Antelope bitterbrush has an estimated cover of 14% and density of 2,400 plants/acre in 2000. Percent decadency is currently (‘00) low at 8% with almost all individuals showing good vigor. Use has steadily decreased on bitterbrush with each reading. Currently (‘00), only 14% display heavy use. This level of utilization is relatively low for bitterbrush and is mostly likely due to the abundance of bitterbrush over the site as well as current light use by big game. Although bitterbrush was noted as producing abundant seed in 2000, few seedlings or young were encountered in 1995 or 2000.

True mountain mahogany and serviceberry occur at much lower densities. Currently (‘00), they have densities estimated at 380 and 120 plants/acre respectively. Poor vigor has been high on serviceberry the past two readings at 78% (‘95) and 50% (‘00). Use is moderate on serviceberry and mostly light on mahogany. With only light to moderate use on bitterbrush, mahogany and serviceberry, this site apparently has not been used by very large numbers of big game over the past several winters.

Grasses are only moderately abundant for a mountain brush site and appear to be suppressed by the abundant shrub cover. Perennial grasses sampled include: thickspike wheatgrass, mutton bluegrass, Kentucky bluegrass and needle-and-thread. Perennial grasses combine to provide just 8% average cover in 2000. Sum of nested frequency of perennial grasses did slightly increase in 2000, but still not back up to the level they were in 1988. Cheatgrass is the most abundant grass, but it significantly decreased in nested frequency in 2000 due to drought.

It still provides nearly 7% average cover and will likely increase with normal precipitation patterns in the future. Forbs are very diverse but not very common. On average, they only contribute 2% average cover in 1995 and 2000. The most common useful forbs are silvery lupine and low penstemon. Sum of nested frequency of perennial forbs decreased by nearly half in 2000 with drought. Forbs will likely never be a significant component at this site due to the dominance of the shrub cover.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable but somewhat unstable. The potential for erosion is high with an herbaceous understory that is not very abundant. However, the abundance of shrub cover helps limit erosion. Vegetative trend also appears stable but could decline if significantly heavier animal use were to be applied. The browse component is healthy with a possibly expanding mountain big sagebrush population. Antelope bitterbrush appears more static, but with adequate vegetative reproduction occurring. Grasses and forbs provide a moderate amount of forage and valuable ground cover, which is essential on this site.

1988 TREND ASSESSMENT

Soil trend is stable with no significant changes in ground cover percentages. The gully through the site is well vegetated and erosion is limited by abundant vegetation and litter cover. The browse trend is stable for the key species, mountain big sagebrush and antelope bitterbrush. Bitterbrush displays more heavy use and increased decadency, but the number of mature plants/acre is similar to that of 1982 and recruitment appears better with an estimated 200 seedlings/acre and 266 young plants/acre. Trend for the herbaceous understory is slightly improved. Quadrat frequency of grasses increased while frequency of forbs remained the same.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - slightly improving (4)

1995 TREND ASSESSMENT

Soil trend remains stable with adequate ground cover from vegetation and litter. The browse trend is stable for mountain big sagebrush and bitterbrush. Density of sagebrush declined overall, but the population of mature plants remains similar. The greatly increased sample size used this year accounts for most of the difference in density between years. Bitterbrush decadence declined from 21% to 3% since 1988, while the proportion of heavily utilized plants also declined. Trend for the herbaceous understory is down likely due to the effects of drought and the dominance of the site by shrubs. Sum of nested frequency of perennial grasses declined by 44% with the frequency of forbs also declining moderately. Cheatgrass is currently the dominate grass on the site.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - down with a high amount of cheatgrass in the understory (1)

2000 TREND ASSESSMENT

Trend for soil is slightly up. Vegetation and litter cover are abundant and well disbursed. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil increased from an already high value of 8.3:1 to 10.5:1. Trend for browse is stable. Mountain big sagebrush has a stable, but overly mature population, with percent decadence slightly increasing. Use is mostly light and vigor generally good. Bitterbrush slightly increased in density, but also shows slight increases in those classified with poor vigor and decadency. However, poor vigor and percent decadency are currently low even with these slight increases. Use remains mostly moderate with heavy use at a moderately low 14%. Recruitment is low for both sagebrush and bitterbrush. The shrub component appears to be suppressing the understory and a thinning treatment should be considered. Trend for the herbaceous understory is stable overall. Sum of nested frequency slightly increased for perennial grasses, but decreased for perennial forbs due to drought. Cheatgrass nested frequency significantly decreased due to drought as well, however, it still remains the dominate understory species.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable (3) and needs to be thinned
herbaceous understory - stable overall; slightly up for grasses, down for forbs (3)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 14

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	$_{b}$169	$_{a}$89	$_{a}$87	43	72	43	38	.80	1.19
G	Bouteloua gracilis	7	14	2	7	3	4	2	.36	.03
G	Bromus tectorum (a)	-	$_{b}$208	$_{a}$158	-	-	60	53	8.42	6.80
G	Carex spp.	$_{a}$-	$_{b}$18	$_{a}$7	1	-	9	2	.41	.30
G	Poa fendleriana	$_{a}$38	$_{a}$24	$_{b}$97	5	18	10	35	.56	2.86
G	Poa pratensis	38	76	76	1	17	25	24	1.77	2.94
G	Poa secunda	$_{b}$80	$_{a}$-	$_{a}$-	35	36	-	-	-	-
G	Sitanion hystrix	-	3	-	-	-	1	-	.00	-
G	Sporobolus cryptandrus	$_{b}$11	$_{a}$-	$_{a}$-	3	4	-	-	-	-
G	Stipa comata	$_{b}$105	$_{a}$27	$_{a}$38	40	51	14	16	.51	.68
Total for Annual Grasses		0	208	158	0	0	60	53	8.42	6.80
Total for Perennial Grasses		448	251	307	135	201	106	117	4.43	8.02
Total for Grasses		448	459	465	135	201	166	170	12.85	14.82
F	Antennaria rosea	3	3	3	1	1	1	1	.15	.15
F	Arabis spp.	15	9	4	4	6	5	3	.02	.04
F	Artemisia ludoviciana	6	6	4	4	4	2	2	.01	.03
F	Castilleja chromosa	-	3	-	-	-	1	-	.00	-
F	Chenopodium leptophyllum (a)	6	15	15	-	3	6	6	.03	.33
F	Comandra pallida	$_{b}$8	$_{a}$-	$_{ab}$4	-	3	-	2	-	.01

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Collinsia parviflora (a)	-	$_{b}$21	$_{a}$-	-	-	9	-	.07	-
F	Crepis acuminata	-	-	1	-	-	-	1	-	.00
F	Cryptantha spp.	$_{b}$4	$_{b}$16	$_{a}$-	11	3	8	-	.09	-
F	Cymopterus spp.	2	3	-	-	1	1	-	.03	-
F	Descurainia pinnata (a)	-	3	3	-	-	1	1	.00	.00
F	Eriogonum racemosum	12	13	6	13	6	6	5	.13	.07
F	Eriogonum umbellatum	$_{b}$5	$_{a}$-	$_{a}$-	5	3	-	-	-	-
F	Ipomopsis aggregata	-	3	-	-	-	1	-	.15	-
F	Lappula occidentalis (a)	-	$_{b}$4	$_{a}$-	-	-	3	-	.01	-
F	Lactuca serriola	-	-	2	-	-	-	1	-	.03
F	Lepidium densiflorum (a)	-	4	-	-	-	2	-	.01	-
F	Lupinus argenteus	10	10	6	7	6	5	3	1.02	.33
F	Microsteris gracilis (a)	-	1	-	-	-	1	-	.00	-
F	Mirabilis linearis var. linearis	$_{b}$13	$_{a}$-	$_{a}$-	-	7	-	-	-	-
F	Oenothera pallida	$_{b}$42	$_{a}$15	$_{a}$12	-	21	6	7	.05	.11
F	Penstemon humilis	$_{a}$-	$_{b}$15	$_{b}$6	-	-	6	3	.37	.04
F	Penstemon spp.	$_{b}$22	$_{ab}$9	$_{a}$2	13	11	4	1	.21	.03
F	Phlox longifolia	3	-	2	-	1	-	1	-	.00
F	Polygonum douglasii (a)	-	3	1	-	-	2	1	.01	.00
F	Schoencrambe linifolia	$_{a}$-	$_{b}$8	$_{a}$1	-	-	4	1	.04	.00
F	Senecio integerrimus	$_{a}$-	$_{b}$7	$_{b}$8	3	-	3	3	.06	.12
F	Senecio multilobatus	-	3	4	17	-	1	2	.00	.01
F	Sisymbrium altissimum (a)	-	-	2	-	-	-	1	-	.15
F	Tragopogon dubius	-	1	-	-	-	1	-	.00	-
F	Unknown forb-perennial	4	-	-	-	1	-	-	-	-
Total for Annual Forbs		6	51	21	0	3	24	9	0.15	0.48
Total for Perennial Forbs		149	124	65	78	74	55	36	2.37	0.99
Total for Forbs		155	175	86	78	77	79	45	2.52	1.48

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 14

Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Amelanchier alnifolia	6	3	.36	.03
B	Artemisia tridentata vaseyana	78	66	21.55	19.42
B	Cercocarpus montanus	11	14	1.89	1.24
B	Chrysothamnus viscidiflorus lanceolatus	11	8	.53	.06
B	Eriogonum heracleoides	6	3	.09	.36
B	Mahonia repens	11	11	.60	.24
B	Opuntia spp.	17	17	.43	.49
B	Pediocactus simpsonii	1	3	-	.03
B	Pinus edulis	-	-	.63	.85
B	Purshia tridentata	59	77	9.26	14.32
B	Sambucus cerulea	4	3	.68	.56
B	Symphoricarpos oreophilus	32	38	5.85	8.13
Total for Browse		236	243	41.90	45.75

CANOPY COVER --
Herd unit 09 , Study no: 14

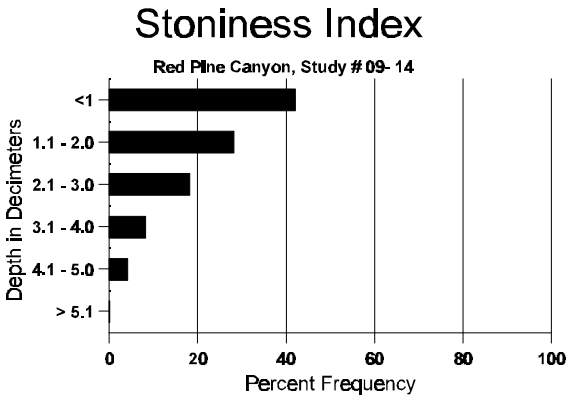
Species	Percent Cover '95	Percent Cover '00
Pinus edulis	-	1

BASIC COVER --
Herd unit 09 , Study no: 14

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '82	Average Cover % '88	Average Cover % '95	Average Cover % '00
Vegetation	350	333	9.00	6.25	47.95	60.52
Rock	192	143	5.25	9.25	13.94	11.85
Pavement	12	4	0	.25	.03	.03
Litter	392	385	75.25	74.50	59.10	69.05
Cryptogams	27	16	4.00	1.50	.64	.89
Bare Ground	93	70	9.00	8.25	4.92	5.51

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 14, Study Name: Red Pine Canyon

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
13.81	54.0 (15.91)	6.7	74.9	13.8	11.3	3.2	15.7	80.0	0.6



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 14

Type	Quadrat Frequency '95	Quadrat Frequency '00	Pellet Transect Pellet Groups per Acre '00	Pellet Transect Days Use per Acre (ha) '00
Rabbit	22	11	705	N/A
Elk	2	1	26	2 (5)
Deer	20	12	426	33 (81)
Cattle	1	2	17	2 (5)
Moose	-	-	9	1 (2)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 14

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	1	-	-	-	-	-	-	-	3	-	60			3
	00	-	-	-	-	-	-	2	-	-	2	-	-	-	40			2
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	1	2	-	-	-	-	-	1	1	4	-	120	32	32	6
	00	-	4	-	-	-	-	-	-	-	1	-	3	-	80	42	46	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	11%	78%	-33%
'00	67%	00%	50%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	0	Dec:		-
'88	0			-
'95	180			-
'00	120			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	18	-	-	-	-	-	-	-	-	18	-	-	-	1200			18
	88	17	1	1	2	-	-	-	-	-	21	-	-	-	1400			21
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	23	-	-	3	-	-	-	-	-	25	1	-	-	1733	27	32	26
	88	32	2	-	-	-	-	-	-	-	31	3	-	-	2266	31	32	34
	95	93	23	-	-	-	-	-	-	-	116	-	-	-	2320	36	48	116
	00	80	6	-	8	-	-	-	-	-	94	-	-	-	1880	41	42	94
D	82	3	1	-	-	-	-	-	-	-	2	-	1	1	266			4
	88	9	1	-	-	-	-	-	-	-	8	-	2	-	666			10
	95	10	5	-	-	-	-	-	-	-	5	-	-	10	300			15
	00	17	4	-	2	-	-	-	-	-	14	-	-	9	460			23
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	320			16
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	420			21

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	02%	00%	04%	+26%
'88	06%	02%	03%	-39%
'95	21%	00%	08%	-11%
'00	08%	00%	08%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	3199	Dec:	8%
	'88	4332		15%
	'95	2640		11%
	'00	2360		19%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	2	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	82	1	1	1	-	-	-	-	-	-	3	-	-	-	200	35	31	3
	88	-	1	1	-	-	-	-	-	-	2	-	-	-	133	47	39	2
	95	5	4	1	-	-	-	-	-	-	10	-	-	-	200	36	39	10
	00	13	-	1	-	1	-	-	-	-	15	-	-	-	300	48	46	15
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	1	1	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	33%	33%	00%	- 1%
'88	67%	33%	00%	+29%
'95	50%	14%	00%	+26%
'00	05%	05%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	200	Dec:		0%
'88	199			0%
'95	280			14%
'00	380			0%

Chrysothamnus viscidiflorus lanceolatus																		
M	82	2	-	-	-	-	-	-	-	-	2	-	-	-	133	14	17	2
	88	-	-	-	1	-	-	-	-	-	1	-	-	-	66	20	7	1
	95	9	-	-	2	-	-	-	-	-	11	-	-	-	220	21	25	11
	00	4	-	1	4	-	-	-	-	-	9	-	-	-	180	19	17	9
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	1	-	-	-	-	-	-	-	1	-	1	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+33%
'88	33%	00%	33%	+10%
'95	00%	00%	00%	-18%
'00	00%	11%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	133	Dec:		0%
'88	199			67%
'95	220			0%
'00	180			0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum heracleoides																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	6	-	-	3	-	-	-	-	-	9	-	-	-	180	11	10	9
	00	1	-	-	4	-	-	-	-	-	5	-	-	-	100	3	10	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	-44%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	180		-
	'00	100		-

Mahonia repens																		
Y	82	100	-	-	-	-	-	-	-	-	100	-	-	-	6666			100
	88	145	56	-	-	-	-	-	-	-	201	-	-	-	13400			201
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	212	-	-	-	-	-	-	-	-	212	-	-	-	14133	7	2	212
	88	54	149	-	-	-	-	124	-	-	320	7	-	-	21800	6	4	327
	95	42	-	-	11	-	-	-	-	-	53	-	-	-	1060	4	5	53
	00	43	-	-	6	-	-	-	-	-	49	-	-	-	980	2	4	49

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+41%
'88	39%	00%	00%	-97%
'95	00%	00%	00%	-18%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	20799	Dec:	-
	'88	35200		-
	'95	1200		-
	'00	980		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	1	-	-	4	-	-	-	-	-	5	-	-	-	100			5
M	82	8	-	-	-	-	-	-	-	-	8	-	-	-	533	2	5	8
	88	6	-	-	1	-	-	-	-	-	7	-	-	-	466	4	7	7
	95	26	-	-	2	-	-	-	-	-	28	-	-	-	560	4	17	28
	00	23	-	-	-	-	-	2	-	-	25	-	-	-	500	4	13	25

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+33%
'88	00%	00%	00%	-25%
'95	00%	00%	00%	+ 0%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	533		-
	'88	799		-
	'95	600		-
	'00	600		-

Pediocactus simpsonii																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	5	6	1
	00	2	-	-	1	-	-	-	-	-	3	-	-	-	60	2	2	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+67%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	0		-
	'88	0		-
	'95	20		-
	'00	60		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	1	-	-	3	-	-	-	200			3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	88	-	1	-	3	-	-	-	-	-	4	-	-	-	266			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	3	-	-	-	-	-	-	-	-	2	-	1	-	60			3
M	82	6	12	2	1	-	-	-	-	-	17	1	3	-	1400	31	38	21
	88	1	6	8	-	-	-	-	-	-	14	-	1	-	1000	29	35	15
	95	49	18	6	11	6	-	-	-	-	90	-	-	-	1800	25	44	90
	00	45	27	17	13	1	-	5	-	-	104	-	4	-	2160	29	45	108
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	4	1	-	-	-	-	-	-	5	-	-	-	333			5
	95	1	-	-	1	1	-	-	-	-	-	-	-	3	60			3
	00	4	3	-	2	-	-	-	-	-	7	-	-	2	180			9
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	55%	09%	14%	+ 8%
'88	46%	38%	04%	+14%
'95	27%	06%	03%	+23%
'00	26%	14%	06%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	1466	Dec:	0%
	'88	1599		21%
	'95	1860		3%
	'00	2400		8%

Sambucus cerulea

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	5	-	-	-	-	-	2	-	-	7	-	-	-	140	48	46	7
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	66	28	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	-29%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	140		-
	'00	100		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	5	-	-	1	-	-	-	-	-	6	-	-	-	400			6
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	8	1	2	-	-	-	-	-	-	10	-	1	-	733			11
	95	12	-	-	-	-	-	-	-	-	12	-	-	-	240			12
	00	4	-	-	1	-	-	-	-	-	5	-	-	-	100			5
M	82	3	3	-	-	-	-	-	-	-	6	-	-	-	400	14	23	6
	88	3	-	1	-	-	-	-	-	-	4	-	-	-	266	15	19	4
	95	53	1	-	15	-	-	-	-	-	69	-	-	-	1380	27	57	69
	00	57	-	-	9	-	-	5	-	-	68	-	3	-	1420	24	48	71

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	50%	00%	00%	+60%
'88	07%	20%	07%	+38%
'95	01%	00%	00%	- 6%
'00	00%	00%	04%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	400		-
	'88	999		-
	'95	1620		-
	'00	1520		-

Trend Study 9-15-00

Study site name: Mud Springs Draw . Range type: Mixed Mountain Brush .

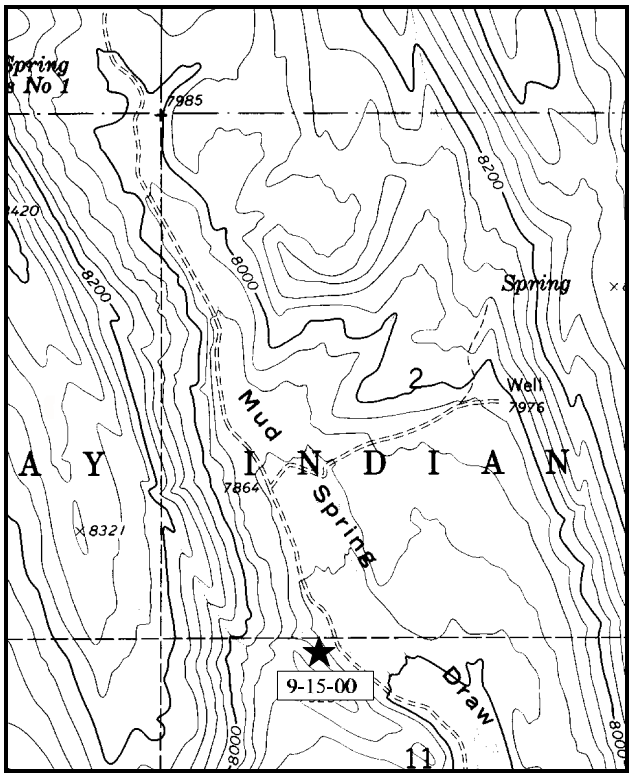
Compass bearing: frequency baseline 328°M .

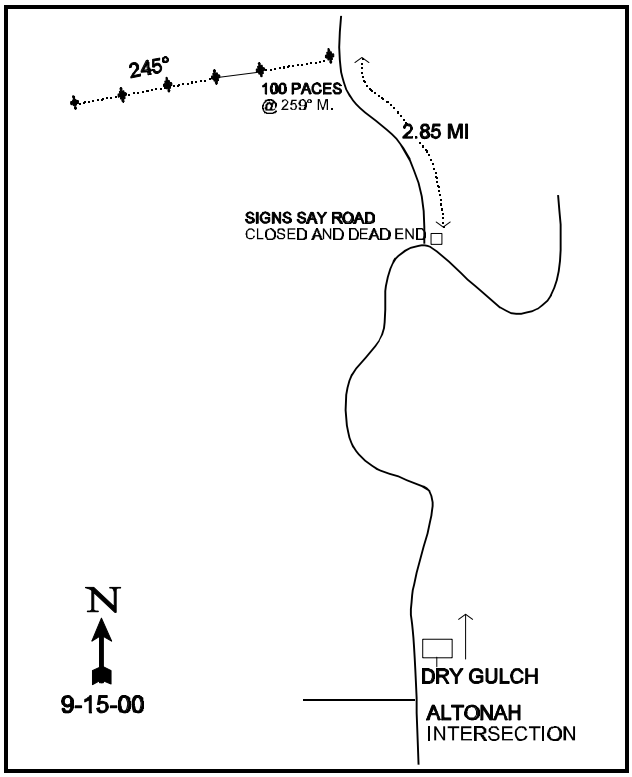
First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (7 & 96ft), line 2 (32ft), line 3 (50ft), line 4 (79ft).

LOCATION DESCRIPTION

From the town of Altonah, proceed north for 2.0 miles to an intersection. Take the road which runs to the northwest for 2.65 miles until you come to another intersection. Go straight through the intersection and go up Mud Spring Draw for 2.85 miles to a red stake on the left side of the road. From the stake, the 0-foot baseline stake is 125 paces away at a bearing of 252°M. The frequency baseline stakes are marked by green steel fenceposts cut to 12-18" in height.

**Roads closed onto the reservation from the south and north.





Map Name: Burnt Mill Springs Diagrammatic Sketch

Township 1N , Range 4W , Section 11 UTM 4483993 N, 558392 E

DISCUSSION

Trend Study No. 9-15 (12-4)

*** This study was not read in 2000 and will be discontinued due to road closures. Only text is included here. For maps and data tables refer to the 1995 Big Game Range Trend Studies report.

The Mud Spring Draw study is located within the Ute Indian Reservation in Mud Spring Draw at approximately 7,000 feet elevation. Cattle grazing and winter use by big game are the principal resource values. The range type is mixed mountain brush with a westerly aspect and a 50% slope.

Soils are rocky and moderately shallow with numerous large rocks on the surface. Vegetation and litter cover are abundant and adequately protect the soil from erosion.

The key preferred browse species is true mountain mahogany which accounts for 50% of the browse cover on the site. Population density has remained somewhat similar in 1982 and 1995, with a notable increase in 1988 due mostly to an increase in the number of young (69% of population was classified as young). This portion of the population can easily be lost when experiencing prolonged drought. Percent decadence is low and vigor generally good. Utilization is light to moderate with heavier use reported in 1988.

Other important secondary species include: serviceberry, mountain big sagebrush, antelope bitterbrush and snowberry. Together these species contribute to 26% of the browse cover. Serviceberry, mountain big sagebrush, and bitterbrush number from 500 to 600 plants/acre. They exhibit moderate to heavy hedging. Sagebrush displays a slightly increased decadency from 1988 (36%, but still quite high) and heavy use. Dead plants number 460 plants/acre which means that almost 50% are dead.

Grasses and forbs are diverse and quite abundant. They provide a total cover of 9%, while forbs account for 12% cover. Bluebunch wheatgrass, slender wheatgrass, Carex, and mutton bluegrass are the most abundant grass species. Annual forbs dominate the forb component with 8 species accounting for 68% of the forb cover. Common perennial species include: hooker balsamroot, sulfur eriogonum and silvery lupine.

1982 APPARENT TREND ASSESSMENT

Current soil condition is fair with an apparent stable to perhaps slightly downward trend. In spite of good vegetative and litter cover, some soil loss is occurring. Slope steepness (50%) is undoubtedly a major contributing factor. Vegetative conditions look good for trend, from a big game winter range standpoint, it appears stable to improving. The condition of the key browse species is especially encouraging.

1988 TREND ASSESSMENT

The soil trend on this site is improving due to the accumulation of litter and minimal evidence of soil movement. Slightly less bare soil was measured in 1988 due to increases in the percentage of basal vegetative cover. The key browse species, true mountain mahogany, continues on an upward trend. It was rated in excellent condition. Individuals were moderately hedged, in good vigor, with few decadent shrubs. Browsing appears to have increased over the years, but it is still well within acceptable levels. Although frequency of the several valuable browse species was unchanged, density of the mountain mahogany, serviceberry and big sagebrush increased. These shrubs also have healthy populations of young plants. In 1988, these species were classified as 16% heavily hedged, 53% moderately hedged and the remainder only lightly used. Trend for the herbaceous understory is improving with significant increases in quadrat frequency for grasses and forbs.

TREND ASSESSMENT
soil - improved (4)
browse - slightly up for key species (4)
herbaceous understory - up (5)

1995 TREND ASSESSMENT

Soil conditions continue to improve. Litter cover declined from 72% to 57%, likely due to prolonged drought, but percent bare ground declined to only 4%. Trend for the key browse species is slightly improved since 1988. Less seedling and young plants were encountered in 1995, but the number of mature plants has remained stable since 1982. It appears that some mature plants might have been classified as young in 1988 resulting in a lower population density for mature plants and an inflated estimate of young plants. Currently, percent decadence is low, vigor is good, and utilization is moderate. Trend for the herbaceous understory is slightly down for grasses, but improved for forbs. Overall the trend appears stable.

TREND ASSESSMENT
soil - up slightly (4)
browse - slightly improved (4)
herbaceous understory - stable (3)

Trend Study 9-16-00

Study site name: Mosby Mountain . Range type: Big Sagebrush-Grass .

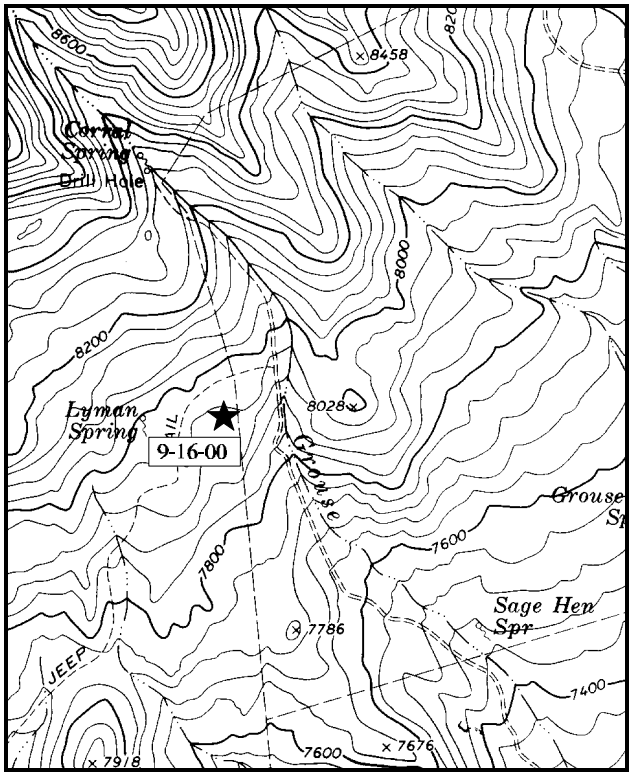
Compass bearing: frequency baseline 155°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 96ft), line 2 (30ft), line 3 (50ft), line 4 (72ft).

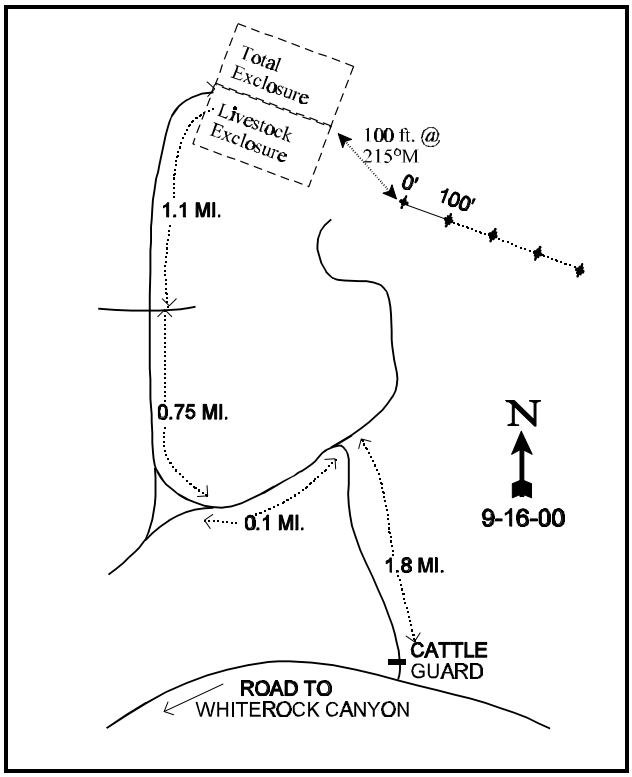
LOCATION DESCRIPTION

From the town of Whiterocks, go east for approximately 1.75 miles to a "T" in the road. Turn left (north) and go 3.5 miles to an intersection where 2 roads fork off to the right Turn right then take the left fork. Head north for approximately 4.0 miles to the Mosby Mountain Exclosure. The 0-foot baseline stake is located 12 paces from the southwest corner of the big game exclosure bearing 210°M.

This site may also be accessed from the east by traveling north through Tridell on 8000 E. Go though the reservation then west to Mosby Mountain.



Map Name: Lake Mountain



Diagrammatic Sketch

Township 3S , Range 18E , Section 14

UTM 4490403.305 N, 595962.705 E

DISCUSSION

Trend Study No. 9-16 (12-5)

The Mosby Mountain study samples a sagebrush-grass type with scattered serviceberry and bitterbrush at an elevation of about 7,900 feet. Slope varies from 8-10% and a southerly aspect. The relatively high elevation may limit or prohibit big game use during severe winters. The study site is in close proximity to the Mosby Mountain big game exclosure and pellet group transect. Soon after the reading of this study in August 1988, the area was burned by a wildfire. During the 1995 reading, it was noted that belts 1 and 5 from the original baseline were not burned while belts 2, 3, and 4 were burned. As a result, most of the shrubs on the burned belts were eliminated. Past and present cattle use is heavy with cattle still on the site during the 1995 and 2000 readings. Pellet group transect data taken along the baseline in 2000 estimate light use by big game and slightly higher use by livestock. Deer use was estimated at 9 days use/acre (22 ddu/ha) and elk use was estimated at 20 days use/acre (50 edu/ha). Livestock use was estimated at 36 days use/acre (89 cdu/ha).

Soil on the site is relatively shallow and rocky with deeper soil further down slope. Effective rooting depth is estimated at just over 9 inches. Soils are loam to sandy clay loam in texture and are fairly high in organic matter (4.5%). Soil reactivity is slightly acidic (pH of 6.4). On nearby steeper slopes, noticeable soil movement was reported in 1988. Bare ground is moderate at about 21% in 2000, but abundant herbaceous vegetation and litter cover keep erosion at minimal levels.

Browse on the site are scattered and accounted for an estimated 8% average cover in 1995, increasing to 11% by 2000. The most abundant shrub in both cover and density is mountain big sagebrush. Density has varied between readings for several reasons, including the burn following the 1988 reading, and the much larger sample size utilized for the northeast region beginning in 1995. The 1988 burn was spotty over the study site with many sagebrush surviving. Mountain big sagebrush density is currently (‘00) estimated at 1,900 plants/acre with light to moderate use and mostly good vigor. Percent decadency increased from 8% in 1995 to 14% in 2000. Recruitment is good at 12% (220 plants/acre). It appears to be adequate to replace the decadent plants classified as dying in the population (80 plants/acre).

Secondary browse species consist of serviceberry and bitterbrush. Total density of serviceberry declined from 1,265 plants/acre in 1988 to 400 by 2000, while bitterbrush declined from about 600 plants/acre in 1988 to 300 in 2000. Changes in density could be due to the burn or the increased sample size used beginning in 1995, or possibly both. Serviceberry shows moderate to heavy use in all readings. Currently (‘00), 50% of the serviceberry display moderate use, with an additional 25% showing heavy use. No decadent plants were sampled in 2000, and vigor is good. A positive trend for serviceberry is the high level of recruitment in 2000 at 20%. Bitterbrush display moderate use on 60% of the population and heavy use on 27% of the population in 2000. Vigor is also good throughout the bitterbrush population with no decadent plants sampled in 2000. Bitterbrush on the site have a prostrate growth form and currently average 1 foot in height with a 3 ½ foot crown. When the site was read in 2000, it was noted that some shrubs of different species have been heavily browsed to the ground. As deer and elk pellet groups are not abundant, this is probably due to cattle use especially during the extended drought during the past decade.

The herbaceous understory is quite diverse and accounts for 75% of the total vegetative cover on the site. Grasses provided about 17% cover in 1995, half of which came from thickspike wheatgrass. In 2000, cover from grasses increased to almost 23%, with thickspike again providing half of this. Nested frequency of thickspike significantly decreased in 2000. Mutton bluegrass is also abundant providing nearly 5% average cover in 2000 and significantly increasing in nested frequency. Other perennial species include: Kentucky bluegrass, Sandberg bluegrass, needle-and-thread, squirreltail and Letterman needlegrass. Some grasses had been heavily utilized when the site was read in 2000. As a group, perennial grasses slightly decreased in sum of

nested frequency in 2000. Cheatgrass, which was moderately abundant in 1995, was not sampled in 2000 due to drought. Forbs are diverse and provide over 11% average cover in 2000. Although average forb cover increased in 2000, sum of nested frequency for perennial species decreased. Annual forbs were abundant in 1995 with the wet spring of that year, but nearly disappeared from the site in 2000 with drought. Many of the forb species are weedy increasers. The most common perennial species include: hooker balsamroot, trailing fleabane, pussytoes and aster.

1982 APPARENT TREND ASSESSMENT

Within the immediate area of the study site, soil trend appears stable to declining. On nearby steeper sites, the trend would be more downward. Vegetative condition is below optimum. Browse density, especially of the more preferred species, is substandard. Animal use is almost certainly one of the more causative factors. Many increaser species of all vegetative classes are present and may be expanding. Range trend appears to be slightly downward.

1988 TREND ASSESSMENT

The soil trend appears fairly stable. Percent bare ground increased slightly, while percent litter cover declined. However, basal vegetative cover increased from 7% to 13%. Mountain big sagebrush has increased in density due to a significant increase in the number of seedlings and young plants. Percent decadence increased from 5% to 28%, but vigor is generally good. The majority of the sagebrush is lightly hedged so this increase in decadency is more a reflection of the age of the stand in conjunction with drought. The more preferred serviceberry and bitterbrush show improved recruitment, but serviceberry displays heavy use on 100% of the mature plants with an increased rate of decadency. Overall trend for browse is stable. Trend for the herbaceous understory is significantly improved. Quadrat frequency of grasses and forbs nearly doubled since 1982. Quadrat frequency of thickspike wheatgrass and mutton grass increased from 52% and 53% respectively to 92% and 95%.

TREND ASSESSMENT
soil - stable (3)
browse - stable for key species with improved recruitment (3)
herbaceous understory - up (5)

1995 TREND ASSESSMENT

Trend for soil is slightly up with a good stand of rhizomatous grasses to help prevent erosion. The fire that burned the site in 1988 reduced the density of the shrubs, but did not eliminate them. The remaining stand of mountain big sagebrush and serviceberry, though smaller, are healthier with less decadence. Use is still heavy yet vigor is good. Trend is stable. Trend for the herbaceous understory is slightly down. Sum nested frequency of perennial grasses and perennial forbs has declined since 1988.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable for key species (3)
herbaceous understory - slightly down for perennial species (2)

2000 TREND ASSESSMENT

Trend for soil is slightly up. Erosion remains minimal as herbaceous vegetation is abundant. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil increased from 2.7:1 to 3.3:1 in 2000.

This ratio indicates high nested frequency values for vegetation and litter and well disbursed protective ground cover over the site. Trend for browse is stable. Mountain big sagebrush has good recruitment at 12%, mostly good vigor and moderate decadence at 14%. Use is light to moderate. Serviceberry have high recruitment at 20%, no decadency and good vigor. Bitterbrush displays good vigor and no decadence. Use is moderate to heavy on both serviceberry and bitterbrush. However, these species can tolerate higher levels of use and don't appear to be negatively affected at the present time. Trend for the herbaceous understory is slightly down as sum of nested frequency for both perennial grasses and forbs slightly decreased in 2000.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable (3)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 16

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	$_{b}$260	$_{b}$266	$_{a}$211	52	92	85	68	8.28	11.19
G	Bromus tectorum (a)	-	$_{b}$115	$_{a}$-	-	-	37	-	1.28	-
G	Poa fendleriana	$_{c}$277	$_{a}$149	$_{b}$200	53	95	59	66	2.87	4.78
G	Poa pratensis	$_{a}$4	$_{c}$105	$_{b}$42	-	2	39	15	1.05	1.29
G	Poa secunda	$_{b}$182	$_{a}$33	$_{a}$30	53	72	13	14	.31	.58
G	Sitanion hystrix	$_{a}$16	$_{a}$19	$_{b}$58	6	10	9	23	.09	1.87
G	Stipa comata	$_{a}$21	$_{a}$63	$_{b}$70	2	12	27	27	1.77	2.75
G	Stipa lettermani	$_{b}$53	$_{b}$58	$_{a}$7	20	22	24	3	.84	.30
Total for Annual Grasses		0	115	0	0	0	37	0	1.28	0
Total for Perennial Grasses		813	693	618	186	305	256	216	15.22	22.78
Total for Grasses		813	808	618	186	305	293	216	16.51	22.78
F	Agoseris glauca	-	3	-	4	-	1	-	.00	-
F	Allium spp.	$_{a}$3	$_{b}$60	$_{a}$-	5	2	30	-	.15	-
F	Antennaria rosea	$_{b}$61	$_{a}$31	$_{ab}$56	10	26	12	22	.93	3.15
F	Arabis spp.	$_{c}$60	$_{b}$12	$_{a}$-	5	32	6	-	.03	-
F	Artemisia ludoviciana	-	-	-	-	-	-	-	-	.00
F	Astragalus purshii	$_{c}$28	$_{b}$7	$_{a}$-	6	9	3	-	.06	-
F	Aster spp.	68	65	75	34	26	29	30	.95	1.70
F	Astragalus spp.	19	2	3	1	6	1	2	.00	.01
F	Balsamorhiza hookeri	$_{c}$157	$_{b}$104	$_{a}$60	24	69	45	28	1.15	2.28
F	Camelina microcarpa (a)	-	$_{b}$7	$_{a}$-	-	-	4	-	.02	-
F	Calochortus nuttallii	3	-	-	-	1	-	-	-	-
F	Collomia linearis (a)	-	$_{b}$75	$_{a}$-	-	-	33	-	.24	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Comandra pallida	-	-	3	-	-	-	2	-	.15
F	Collinsia parviflora (a)	-	$_{b}$60	$_{a}$9	-	-	25	4	.27	.02
F	Crepis acuminata	$_{a}$-	$_{b}$18	$_{a}$-	-	-	9	-	.07	-
F	Cryptantha spp.	-	1	-	-	-	1	-	.00	-
F	Cymopterus spp.	-	3	3	-	-	1	1	.00	.00
F	Descurainia pinnata (a)	$_{b}$23	$_{b}$27	$_{a}$2	-	11	15	1	.10	.00
F	Eriogonum alatum	$_{b}$122	$_{a}$3	$_{a}$11	4	47	3	4	.01	.24
F	Erigeron flagellaris	$_{a}$19	$_{a}$30	$_{b}$92	11	9	13	38	.09	2.88
F	Eriogonum umbellatum	$_{b}$6	$_{ab}$1	$_{a}$-	4	4	1	-	.03	-
F	Heterotheca villosa	$_{a}$-	$_{b}$13	$_{b}$12	-	-	6	7	.20	.16
F	Lappula occidentalis (a)	-	1	-	-	-	1	-	.00	-
F	Lactuca serriola	$_{a}$-	$_{b}$5	$_{a}$-	-	-	3	-	.01	-
F	Lepidium densiflorum (a)	-	$_{b}$92	$_{a}$-	-	-	45	-	.25	-
F	Lithospermum ruderale	8	15	7	-	4	8	5	.41	.08
F	Lupinus argenteus	$_{ab}$17	$_{a}$3	$_{b}$23	8	9	2	11	.06	.35
F	Microsteris gracilis (a)	-	4	-	-	-	2	-	.01	-
F	Penstemon spp.	15	8	9	3	10	3	5	.01	.10
F	Phlox longifolia	$_{b}$24	$_{ab}$16	$_{a}$2	-	11	7	1	.03	.00
F	Polygonum douglasii (a)	-	$_{b}$177	$_{a}$4	15	-	65	1	1.08	.00
F	Potentilla gracilis	-	1	2	-	-	1	1	.00	.15
F	Sedum lanceolatum	5	1	-	1	2	1	-	.00	-
F	Senecio multilobatus	-	-	1	-	-	-	1	-	.00
F	Sphaeralcea coccinea	$_{ab}$13	$_{b}$19	$_{a}$3	8	6	8	2	.11	.06
F	Taraxacum officinale	$_{a}$-	$_{c}$28	$_{b}$6	-	-	13	3	.16	.06
F	Tragopogon dubius	10	6	5	-	8	3	3	.04	.04
Total for Annual Forbs		23	443	15	15	11	190	6	1.98	0.02
Total for Perennial Forbs		638	455	373	128	281	210	166	4.59	11.47
Total for Forbs		661	898	388	143	292	400	172	6.57	11.50

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 16

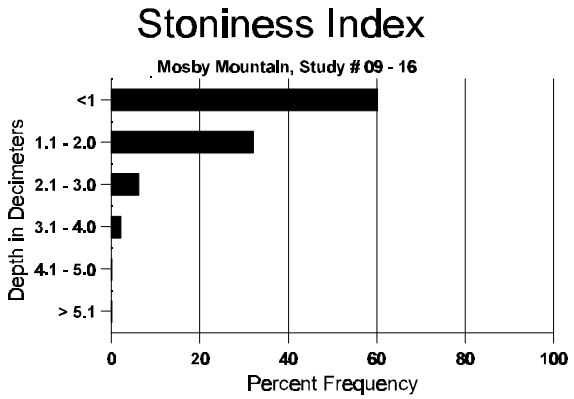
Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Amelanchier alnifolia	22	19	1.81	2.75
B	Artemisia tridentata vaseyana	41	43	3.40	4.54
B	Ceanothus fendleri	7	7	1.92	2.12
B	Chrysothamnus nauseosus graveolens	0	1	-	-
B	Chrysothamnus viscidiflorus lanceolatus	4	3	.18	.03
B	Eriogonum heracleoides	12	6	.56	.30
B	Gutierrezia sarothrae	3	7	-	.15
B	Opuntia spp.	6	5	-	.03
B	Purshia tridentata	10	12	.03	1.00
B	Symphoricarpos oreophilus	6	6	.06	.15
Total for Browse		111	109	7.98	11.09

BASIC COVER --
Herd unit 09 , Study no: 16

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '82	Average Cover % '88	Average Cover % '95	Average Cover % '00
Vegetation	369	365	7.00	13.00	39.93	49.49
Rock	193	102	.25	2.50	6.85	7.48
Pavement	94	60	.50	1.00	.23	.60
Litter	395	392	72.00	56.50	49.51	50.47
Cryptogams	2	23	.75	5.25	.00	.46
Bare Ground	282	234	19.50	21.75	14.68	20.87

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 16, Study Name: Mosby Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.29	59.2 (10.00)	6.4	50.9	28.8	20.3	4.5	27.8	316.8	1.4



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 16

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	3	-	174	N/A
Horse	1	-	-	-
Elk	21	13	261	20 (50)
Deer	16	12	122	9 (22)
Cattle	24	7	426	36 (88)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 16

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	4	-	-	-	-	-	-	-	1	3	-	-	266			4
	88	8	1	-	-	-	-	1	-	-	9	-	1	-	666			10
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	1	1	-	1	-	-	1	-	-	4	-	-	-	80			4
M	82	-	2	10	-	-	-	-	-	-	-	11	1	-	800	23	25	12
	88	-	-	5	-	-	-	-	-	-	5	-	-	-	333	35	37	5
	95	2	8	9	2	-	-	-	-	-	21	-	-	-	420	23	34	21
	00	2	6	2	-	3	3	-	-	-	16	-	-	-	320	31	43	16
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	3	1	-	-	-	-	-	-	4	-	-	-	266			4
	95	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	38%	63%	06%	+16%
'88	21%	32%	05%	-64%
'95	39%	39%	00%	-13%
'00	50%	25%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	1066		0%
	'88	1265		21%
	'95	460		4%
	'00	400		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	6	-	-	-	-	-	-	-	-	6	-	-	-	400			6
	88	10	-	-	-	-	-	-	-	-	10	-	-	-	666			10
	95	4	2	-	-	-	-	-	-	-	6	-	-	-	120			6
	00	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
M	82	34	2	-	-	-	-	-	-	-	32	4	-	-	2400	16	21	36
	88	19	9	-	1	-	-	-	-	-	29	-	-	-	1933	25	29	29
	95	11	41	16	-	-	-	-	-	-	68	-	-	-	1360	14	21	68
	00	50	21	-	-	-	-	-	-	-	71	-	-	-	1420	13	23	71
D	82	1	1	-	-	-	-	-	-	-	-	2	-	-	133			2
	88	13	1	-	1	-	-	-	-	-	14	-	1	-	1000			15
	95	-	6	-	-	-	-	-	-	-	6	-	-	-	120			6
	00	7	6	-	-	-	-	-	-	-	9	-	-	4	260			13
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	220			11
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	120			6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	07%	00%	00%	+19%
'88	19%	00%	02%	-56%
'95	61%	20%	00%	+16%
'00	28%	00%	04%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	2933	Dec:	5%
	'88	3599		28%
	'95	1600		8%
	'00	1900		14%

Ceanothus fendleri																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	13	-	-	-	-	-	-	-	-	13	-	-	-	260	9	54	13
	00	10	-	-	-	-	-	-	-	-	10	-	-	-	200	11	67	10

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	-23%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	260		-
	'00	200		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus graveolens																		
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	19	15	1
	88	-	-	-	1	-	-	-	-	-	-	-	1	-	66	29	9	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	11	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	15	19	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+ 0%
'88	00%	00%	100%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	66	Dec:		-
'88	66			-
'95	0			-
'00	20			-

Chrysothamnus viscidiflorus lanceolatus																		
Y	82	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	88	4	-	-	-	-	-	-	-	-	1	-	3	-	266			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266	10	14	4
	88	6	-	-	-	-	-	-	-	-	3	-	3	-	400	7	9	6
	95	3	-	1	-	-	-	-	-	-	4	-	-	-	80	8	13	4
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	6	10	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+40%
'88	00%	00%	60%	-88%
'95	00%	25%	00%	-25%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	399	Dec:	-
'88	666		-
'95	80		-
'00	60		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum heracleoides																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	18	-	-	-	-	-	-	-	-	18	-	-	-	360	5	16	18
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140	4	11	7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	-59%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	540		-
	'00	220		-

Eriogonum microthecum																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	2	1	-	-	-	-	-	-	-	3	-	-	-	200	4	7	3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	25%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	266		-
	'95	0		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	6	-	-	-	-	-	-	-	-	6	-	-	-	120	9	12	6
	00	15	-	-	-	-	-	-	-	-	15	-	-	-	300	7	8	15

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+63%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	120		-
	'00	320		-

Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	-	-	1	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	4	-	-	-	-	-	-	-	-	2	-	2	-	266			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	82	2	-	-	-	-	-	-	-	-	2	-	-	-	133	1	12	2
	88	6	-	-	-	-	-	-	-	-	6	-	-	-	400	4	9	6
	95	7	-	-	-	-	-	-	-	-	5	-	2	-	140	3	14	7
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	2	12	2
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	6	-	-	-	-	-	-	-	-	5	-	-	1	120			6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+80%
'88	00%	00%	20%	-79%
'95	00%	00%	29%	+30%
'00	00%	00%	10%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	133	Dec:	0%
	'88	666		0%
	'95	140		0%
	'00	200		60%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	3	1	-	-	-	-	-	-	-	4	-	-	-	266			4
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	3	2	-	-	-	-	-	-	5	-	-	-	333	7	19	5
	88	-	2	3	-	-	-	-	-	-	5	-	-	-	333	10	19	5
	95	1	6	2	-	-	-	-	-	-	9	-	-	-	180	10	32	9
	00	1	6	3	1	3	1	-	-	-	15	-	-	-	300	12	42	15

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	60%	40%	00%	+44%
'88	33%	33%	00%	-60%
'95	50%	17%	00%	+20%
'00	60%	27%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	333	Dec:	-
	'88	599		-
	'95	240		-
	'00	300		-

Sambucus cerulea																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	47	69	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	1	-	-	-	-	-	1	-	-	-	66	16	14	1
	95	2	1	3	-	-	-	-	-	-	6	-	-	-	120	11	19	6
	00	5	-	-	1	-	-	1	-	-	7	-	-	-	140	15	21	7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	+67%
'95	10%	30%	00%	-30%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	66		-
	'95	200		-
	'00	140		-

Trend Study 9-17-00

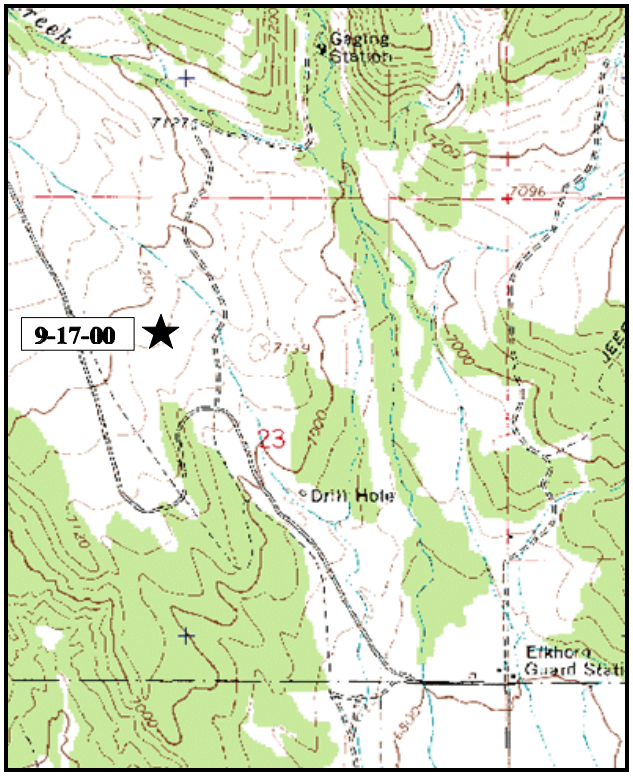
Study site name: Farm Creek . Range type: Big Sagebrush-Grass .

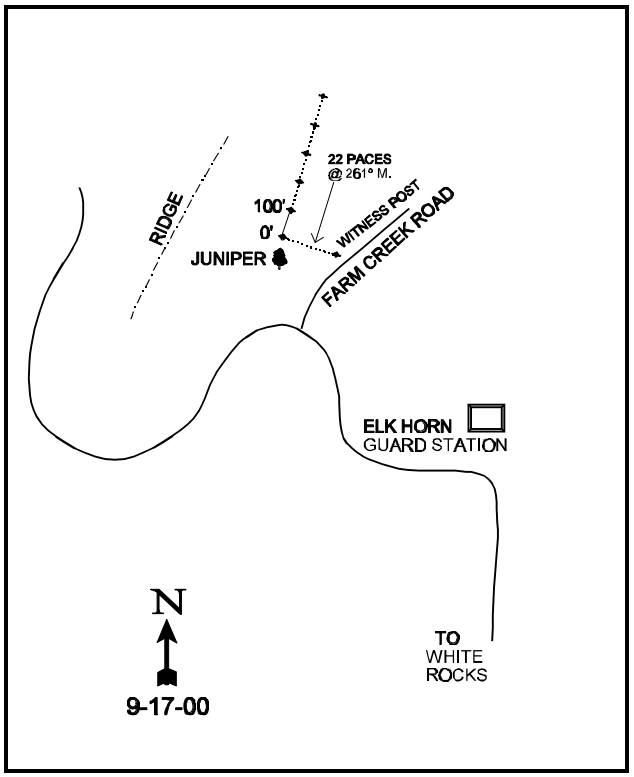
Compass bearing: frequency baseline 322°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From the Elk Horn Guard Station located North of White Rocks, continue on USFS road #117 to the Farm Creek Road for 1 mile. At the first switchback turn right (north) and travel 0.1 miles to the witness located on the left (west) side of the road. From the witness walk 22 paces at 261°M to the 0 foot baseline stake.





Map Name: Ice cave Peak Diagrammatic Sketch

Township 2N , Range 1W , Section 23 UTM 4490101.235 N, 587599.836 E

DISCUSSION

Trend Study No. 9-17 (12-10)

The Farm Creek study was established in 1995 to replace the trend study in Cart Hollow which is now inaccessible with a road exclosure. This site monitors a sagebrush grass type on Forest Service land. Elevation at the site is approximately 7,100 feet with a southern exposure and slope of 6% to 8%. The area is considered winter range, but current use by big game is light. Pellet group transect data taken along the baseline in 2000 estimate 27 deer days use/acre (66 ddu/ha) and 8 elk days use/acre (20 edu/ha). Livestock use is estimated at 15 cow days use/acre (36 cdu/ha). This area is in the Farm Creek allotment which is grazed by cattle on a 4-unit rest-rotation system from June 11 to September 10. Quadrat frequency of deer, elk, and cow pellets are all less in 2000 compared to 1995.

Soils are sandy loam in texture and very rocky in the profile. Effective rooting depth is estimated at just over 10 inches. Rooting depth does not appear be restricted as mountain big sagebrush, a deep rooted species, is dominant on the site. Bare ground is low at an estimated 7% in 1995, increasing to 12% in 2000. Vegetation and litter are abundant, with mountain big sagebrush, bitterbrush and crested wheatgrass dominating the site. Pedestaling of soil around bunch grasses is minimal, increasing slightly around sagebrush stems.

The dominant browse is mountain big sagebrush, with bitterbrush also being fairly abundant. These two species combine to provide over 95% of the total browse cover on the site and nearly half of the total vegetative cover. Mountain big sagebrush has an estimated cover of 15% and a population density of 3,560 plants/acre in 2000. Sagebrush recruitment slightly increased from 8% to 11% in 2000, while percent decadency shows a large increase from 1% to 29%. Use on sagebrush is light to moderate so this increase in decadency can be attributed to drought. Other sagebrush sites in the region also show an increase in decadency in 2000 with the dry conditions. The proportion of decadent plants classified as dying is relatively low (40 plants/acre), with numbers of young plants being adequate to replace this class of plants. Sagebrush vigor remains good. Average leader growth on sagebrush is only 1 inch in 2000.

The more preferred antelope bitterbrush had an estimated population of about 2,100 plants/acre in 1995 and 2000. These shrubs have a prostrate growth form averaging 19 inches in height and a crown of 42 inches. Use is moderate to heavy but bitterbrush can tolerate heavier levels of use than sagebrush. With a low amount of deer and elk sign on this site in 2000, some of the use on bitterbrush is likely from livestock. Vigor remains mostly good, with percent decadency stable at 13%. Bitterbrush seedlings are rare, but recruitment from young plants is good at 16% and 9% in 1995 and 2000 respectively. Average leader growth is between 2-3 inches in 2000, with moderate seed production. Other browse found on the site consist of pricklypear cactus, mountain low rabbitbrush and broom snakeweed.

Crested wheatgrass dominates the understory by providing almost 27% average cover in 2000, representing 92% of the herbaceous cover. Crested wheatgrass is vigorous and was sampled in 94% and 99% of the quadrats in 1995 and 2000 respectively. Bulbous bluegrass is the second most abundant grass. This species significantly decreased in nested frequency in 2000 and only provides about 1% cover. Forbs are diverse but not abundant as they provide under 2% average cover in 1995 and 2000. Sum of nested frequency of perennial forbs decreased by 57% in 2000. With the dry conditions in 2000, the decrease in forb frequency has been seen in most other sites in this management unit as well.

1995 APPARENT TREND ASSESSMENT

The soil trend appears stable as long as vegetation and litter cover remain high. No erosion is currently occurring. The browse trend appears stable for mountain big sagebrush due to low decadency rates, the lack of dead plants, and adequate numbers of seedlings and young. Trend for bitterbrush also appears stable. Use is mostly moderate and decadency rates low (13%). The herbaceous understory is in good condition but species composition is poor. The seeded species, crested wheatgrass, is abundant but the other perennial grasses are rare. Forbs are diverse but scarce.

2000 TREND ASSESSMENT

Trend for soil is stable. Protective cover from vegetation and litter are abundant. Bare ground is relatively low. Trend for browse is stable. Mountain big sagebrush experienced a large increase in decadency from 1% to 29%, but with only light use, this increase is drought related. Recruitment is good at 11%. Bitterbrush is stable in density and decadency. It has moderate recruitment numbers at 9%. Vigor is good for both species. Trend for the herbaceous understory is stable. Although sum of nested frequency of perennial forbs significantly decreased in 2000, forbs only provide 3% of the vegetative cover on the site and this decrease does not warrant a downward trend. Nested frequency of the dominant species, crested wheatgrass, increased which counters the loss of perennial forbs.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 17

Type	Species	Nested Frequency '95	Nested Frequency '00	Quadrat Frequency '95	Quadrat Frequency '00	Average Cover % '95	Average Cover % '00
G	Agropyron cristatum	387	405	94	99	17.89	26.90
G	Agropyron dasystachyum	3	8	1	5	.00	.05
G	Bromus tectorum (a)	17	*-	5	-	.05	-
G	Poa bulbosa	85	*51	28	20	2.67	.85
G	Poa fendleriana	5	8	2	3	.06	.04
G	Poa pratensis	5	-	1	-	.03	-
G	Poa secunda	2	-	1	-	.00	-
Total for Annual Grasses		17	0	5	0	0.05	0
Total for Perennial Grasses		487	472	127	127	20.67	27.85
Total for Grasses		504	472	132	127	20.72	27.85
F	Allium spp.	20	*-	13	-	.06	-
F	Antennaria rosea	-	4	-	1	-	.38
F	Arabis spp.	14	*3	8	1	.06	.00
F	Artemisia ludoviciana	27	*7	11	3	.18	.18

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
F	Astragalus convallarius	7	2	4	1	.21	.03
F	Balsamorhiza hookeri	4	3	2	2	.01	.06
F	Castilleja linariaefolia	1	-	1	-	.00	-
F	Conyza canadensis (a)	6	-	2	-	.01	-
F	Collomia linearis (a)	48	*-	22	-	.16	-
F	Collinsia parviflora (a)	-	4	-	1	-	.00
F	Cryptantha spp.	5	-	2	-	.01	-
F	Draba reptans (a)	64	*1	22	1	.11	.00
F	Erigeron eatonii	-	6	-	2	-	.01
F	Erigeron flagellaris	4	*13	1	6	.00	.22
F	Eriogonum racemosum	10	4	6	3	.14	.07
F	Heterotheca villosa	12	*5	4	2	.33	.18
F	Lappula occidentalis (a)	9	*-	4	-	.02	-
F	Lactuca serriola	2	-	1	-	.00	-
F	Lepidium densiflorum (a)	55	*-	24	-	.17	-
F	Lithospermum ruderale	-	4	-	2	.03	.18
F	Lomatium spp.	3	-	2	-	.01	-
F	Lupinus argenteus	-	4	-	3	-	.04
F	Microsteris gracilis (a)	1	-	1	-	.00	-
F	Orobanche spp.	2	-	1	-	.00	-
F	Phlox longifolia	14	*-	4	-	.02	-
F	Polygonum douglasii (a)	49	*-	20	-	.12	-
F	Schoencrambe linifolia	9	*-	3	-	.01	-
F	Sphaeralcea coccinea	21	11	7	4	.10	.12
F	Tragopogon dubius	1	-	1	-	.00	-
F	Trifolium gymnocarpon	9	3	5	1	.05	.03
F	Zigadenus paniculatus	1	2	1	1	.00	.00
Total for Annual Forbs		232	5	95	2	0.60	0.00
Total for Perennial Forbs		166	71	77	32	1.30	1.51
Total for Forbs		398	76	172	34	1.90	1.52

* Indicates significant difference at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 17

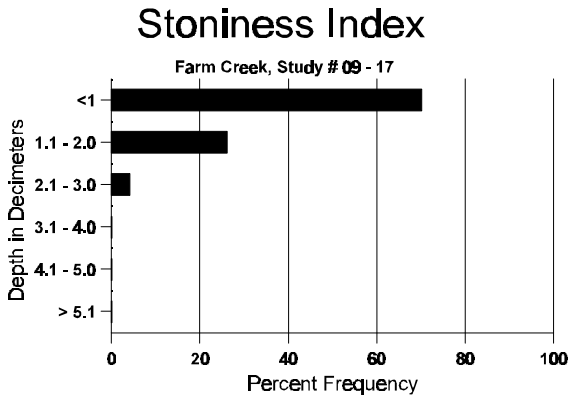
Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Amelanchier alnifolia	1	1	-	-
B	Artemisia tridentata vaseyana	66	77	13.01	15.14
B	Chrysothamnus viscidiflorus lanceolatus	2	0	-	-
B	Gutierrezia sarothrae	14	26	.04	.88
B	Opuntia spp.	21	18	.39	.16
B	Pediocactus simpsonii	2	1	-	-
B	Purshia tridentata	51	54	6.77	11.37
Total for Browse		157	177	20.23	27.55

BASIC COVER --
Herd unit 09 , Study no: 17

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '95	Average Cover % '00
Vegetation	445	417	45.22	52.87
Rock	268	197	10.75	10.65
Pavement	135	89	.50	.92
Litter	490	465	56.27	58.82
Cryptogams	36	57	.39	1.21
Bare Ground	225	227	7.24	11.98

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 17, Study Name: Farm Creek

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
10.58	63.4 (11.02)	6.8	58.9	22.8	18.3	3.7	19.2	211.2	1.0



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 17

Type	Quadrat Frequency '95	Quadrat Frequency '00	Pellet Transect: Pellet Groups per Acre '00	Pellet Transect: Days Use per Acre (ha) '00
Rabbit	10	16	574	N/A
Elk	4	2	104	8 (20)
Deer	9	2	348	27 (66)
Cattle	22	11	174	15 (36)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 17

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
M	95	-	-	1	-	-	-	-	-	-	-	-	1	-	20	8	22	1
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20	22	27	1
% Plants Showing		Moderate Use		Heavy Use		Poor Vigor									%Change			
	'95	00%		100%		100%									+ 0%			
	'00	00%		00%		00%												
Total Plants/Acre (excluding Dead & Seedlings)													'95		20	Dec:		-
													'00		20			-
Artemisia tridentata vaseyana																		
S	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	95	9	-	-	3	-	-	-	-	-	12	-	-	-	240			12
	00	17	2	-	-	-	-	-	-	-	19	-	-	-	380			19
M	95	95	33	-	2	-	-	-	-	-	130	-	-	-	2600	24	41	130
	00	103	3	-	2	-	-	-	-	-	108	-	-	-	2160	28	39	108
D	95	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
	00	17	29	-	5	-	-	-	-	-	49	-	-	2	1020			51
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		Moderate Use		Heavy Use		Poor Vigor									%Change			
	'95	23%		.69%		00%									+20%			
	'00	19%		00%		01%												
Total Plants/Acre (excluding Dead & Seedlings)													'95		2860	Dec:		1%
													'00		3560			29%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus lanceolatus																		
Y	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	95	5	-	-	1	-	-	-	-	-	6	-	-	-	120	14	23	6
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	15	28	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'95	140	Dec:	-
	'00	0		-

Gutierrezia sarothrae																		
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	95	25	-	-	-	-	-	-	-	-	25	-	-	-	500	9	12	25
	00	110	-	-	-	-	-	-	-	-	110	-	-	-	2200	7	8	110
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'95	00%	00%	00%	+78%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'95	500	Dec:	0%
	'00	2280		2%

Opuntia spp.																		
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	95	52	-	-	1	-	-	-	-	-	53	-	-	-	1060	5	9	53
	00	27	-	-	1	-	-	-	-	-	28	-	-	-	560	2	9	28
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	1	-	-	-	-	-	2	-	-	1	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'95	00%	00%	00%	-36%
'00	00%	00%	03%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'95	1060	Dec:	0%
	'00	680		9%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pediocactus simpsonii																		
M	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	2	3	2
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	2	3	1
% Plants Showing		'95		Moderate Use 00%			Heavy Use 00%			Poor Vigor 00%					%Change -50%			
		'00		00%			00%			00%								
Total Plants/Acre (excluding Dead & Seedlings)													'95		40	Dec:		-
													'00		20			-
Purshia tridentata																		
S	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	95	10	7	-	-	-	-	-	-	-	17	-	-	-	340			17
	00	2	2	1	1	-	-	3	-	-	9	-	-	-	180			9
M	95	3	31	33	4	2	1	-	-	-	74	-	-	-	1480	13	37	74
	00	11	31	18	-	18	-	5	-	-	83	-	-	-	1660	19	42	83
D	95	-	3	9	-	2	-	-	-	-	13	-	-	1	280			14
	00	-	9	3	-	-	-	-	-	-	10	-	-	2	240			12
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	280			14
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
% Plants Showing		'95		Moderate Use 43%			Heavy Use 41%			Poor Vigor .95%					%Change - 1%			
		'00		58%			21%			02%								
Total Plants/Acre (excluding Dead & Seedlings)													'95		2100	Dec:		13%
													'00		2080			12%

Trend Study 9-18-00

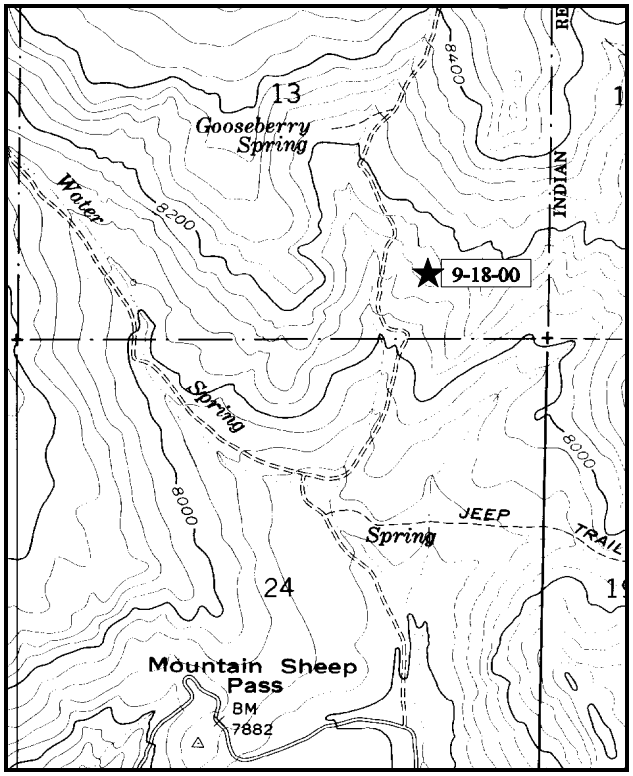
Study site name: Gooseberry Spring . Range type: Mixed Mountain Brush

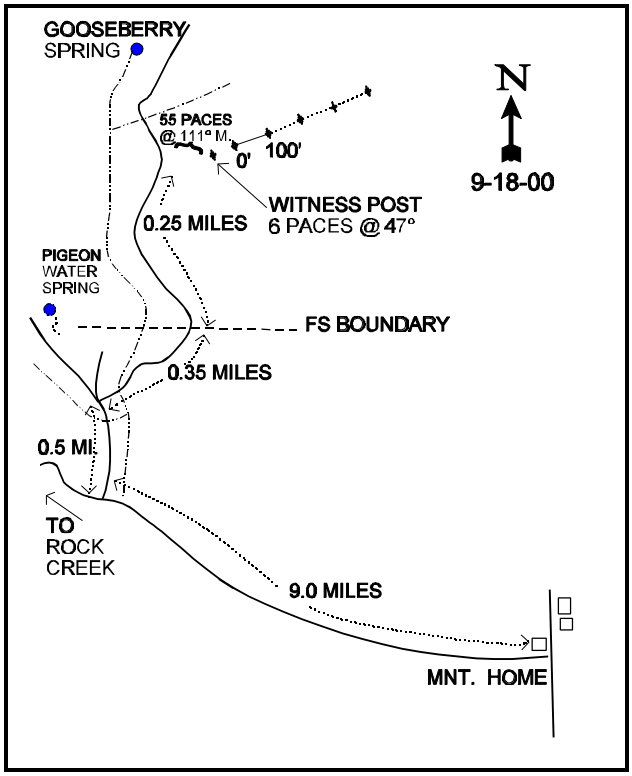
Compass bearing: frequency baseline 47°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (16 & 92ft), line 2 (30ft), line 3 (47ft), line 4 (66ft).

LOCATION DESCRIPTION

From the town of Mountain Home, travel in a northwest direction towards Rock Creek. Approximately 9.0 miles from Mountain Home, you will come to a dirt road to the right (north). Before the road, there is a sign which points to Pigeon Water Spring. Take the dirt road to the north for 0.5 miles to a 3-way fork. Take the right fork for 0.35 miles to the forest boundary. From the fence, continue 0.25 miles to a bend in the road in a small drainage. From the road, the 0-foot baseline stake is approximately 65 paces up the drainage. The frequency baseline stakes are marked by green, 18 inch tall fenceposts. The 0-foot baseline stake is marked with a browse tag, #7196.





Map Name: Dry Mountain Diagrammatic Sketch

Township 1N , Range 6W ,Section 13 UTM 4480676.190 N, 541631.574 E

DISCUSSION

Trend Study No. 9-18 (12-7)

The Gooseberry Spring trend study is located on high winter range near Gooseberry Spring on the Ashley National Forest. Elevation is approximately 8,160 feet. The aspect is to the southwest with a slope of 13%. The range type is mixed mountain brush with a strong black sagebrush component. The baseline runs up a small draw which contains a large number of serviceberry, snowberry and mountain big sagebrush. The side hills are drier and dominated by nearly pure stands of black sagebrush. Intense animal use from deer, elk, cattle and possibly domestic sheep was reported in 1982. However, quadrat frequency of deer and elk pellet groups were moderately low in 1995 and 2000. Pellet group transect data taken along the baseline in 2000 estimate 12 deer days use/acre (30 ddu/ha) and 48 elk days use/acre (117 edu/ha). Livestock use was estimated at 7 cow days use/acre (18 cdu/ha). This site is in the Pigeon Water allotment which is grazed by cattle from June 16 to September 25 on a rest-rotation system.

Soils have a clay texture and are variable in depth. Soil depth is relatively shallow on the sides of the draws, increasing in the drainage bottoms. In the draw where the site is located, effective rooting depth is estimated at nearly 15 inches. Phosphorus is low at 4.8 ppm as values less than 10 ppm may be limiting to plant growth and development. Vegetation and litter cover are abundant, although both slightly decreased in 2000. Bare ground increased in 2000, but remains moderately low at 14%. Rock cover is high at 12%. Current erosion levels are not severe, although there is evidence of soil movement and pedestalling is moderate.

The browse composition is diverse, and provides at least 60% of the total vegetative cover in 1995 and 2000. Preferred key species include: mountain big sagebrush, black sagebrush, serviceberry and bitterbrush. Snowberry is also abundant and provides more cover than any other species. These 5 species make up over 90% of the total browse cover on the site. Serviceberry density is estimated at 1,380 plants/acre in 2000, with mature plants making up about 75% of the population. Mature serviceberry average nearly 3 feet in height and crown. They currently (‘00) show moderate to heavy use. Vigor is generally good, with the proportion of the population displaying poor vigor increasing to only 6% in 2000. Percent decadency is low at 10%, with high recruitment at 19% (260 plants/acre) in 2000. Average leader growth is low averaging less than 2 inches in 2000 due to drought. Mountain big sagebrush shows a stable population at around 2,400 plants/acre in 1995 and 2000. Mature plants have numbered approximately 2,000 plants/acre during the last 3 readings. In 1995, use was mostly moderate on big sagebrush (60%) with 8% of the population displaying heavy use. Currently (‘00), moderate and heavy use have decreased to an estimated 18% and 4% respectively. Twenty-four percent of the population displays poor vigor, an increase from 9% in 1995. Percent decadency is low at 10% and recruitment is good at 13%. Leader growth on big sagebrush is low in 2000, averaging about 3 inches.

Another important browse species is bitterbrush. Bitterbrush density is currently estimated at 420 plants/acre. The population has good vigor and no decadent plants. Moderate and heavy use are currently estimated at 24%, a decrease in moderate use, but an increase in heavy use since 1995. Recruitment increased from 4% in 1995 to 10% in 2000. Leader growth averages about 3 inches in 2000. Black sagebrush has an estimated density of 2,900 plants/acre in 2000, a decrease from 4,360 plants/acre in 1995. This large decrease in population density is due to the difference in young plants between 1995 and 2000. In 1995, 1,200 young plants/acre were estimated, decreasing to only 40 in 2000. In 2000, vigor is mostly good on black sagebrush plants and percent decadency is moderately low at 10%. Although not a preferred forage species, snowberry is abundant and currently (‘00) estimated at 4,240 plants/acre. Use is light, vigor good, with no decadent plants being sampled in either 1995 or 2000.

The herbaceous understory is diverse for both grasses and forbs. Dominant grasses are mutton bluegrass and thickspike wheatgrass. Kentucky bluegrass, Sandberg bluegrass, a Carex and prairie junegrass are also present

on the site. Sum of nested frequency of these perennial species decreased by 20% in 2000. Kentucky bluegrass was heavily utilized in 2000. Many forb species are present on the site, yet none are very abundant. Sum of nested frequency of perennial forbs decreased by 53% in 2000 due to drought. Low growing and increaser species are prominent and include: rose pussytoes, desert phlox, fleabane, aster and dandelion. The current forb composition is indicative of many years of heavy grazing on this site.

1982 APPARENT TREND ASSESSMENT

Soil trend appears stable. There is little evidence for any extensive soil movement. Vegetative trend, at least with respect to the browse component, is more questionable. A stable condition may currently exist, but the potential for a decline is present. The area is receiving heavy use over a large part of the year, the effect of which is unclear at present. Careful monitoring of shrub populations should provide some answers in the near future.

1988 TREND ASSESSMENT

Ground cover percentages are fairly constant. Slight increases in vegetative, litter and rock cover led to a decrease in the percentage of bare soil to about 17%. Soil movement is minimal. Browse trend is up. The age structure of snowberry and serviceberry suggest that the populations are increasing. Serviceberry did increase significantly in density since 1982. Eighty percent of the serviceberry were classified as seedlings or young shrubs, as were 71% of the snowberry. The age structure of the sagebrush population has not changed since 1982 and it has declined slightly in numbers. The most significant trend is the reduction in the number of heavily hedged shrubs; down from 21% of the total in 1982 to 3% in 1988. Vigor is apparently improving. Another indicator of a positive trend is the prevalence of young plants in the populations of the key browse species. There is not much sign of recent use by big game. Trend for the herbaceous understory is up with increased frequency for grasses and forbs. A total of 40 species of forbs were encountered in the nested frequency plots, up from 20 species in 1982. Most occur only occasionally, but as a group, the forbs constitute an important source of forage at this high-elevation winter range site. Eaton fleabane, desert phlox, lupine, rock goldenrod, and looseflower milkvetch continue to top the list of the most frequent forbs. The increase in total forb frequency is significant, changing from 169 to 457 occurrences.

TREND ASSESSMENT
soil - stable (3)
browse - up for key species (5)
herbaceous understory - up (5)

1995 TREND ASSESSMENT

Trend for ground cover is slightly improved. Percent bare ground declined to only 7%, down from almost 17%. Percent cover of litter declined, however litter and vegetative cover are adequate to protect the soil surface. Trend for browse is improved slightly for the key species due to reduced heavy use, improved vigor and lower decadency rates. Trend for the herbaceous understory is down for grasses and stable for forbs. Overall, the herbaceous trend is slightly down but will likely rebound with normal precipitation patterns.

TREND ASSESSMENT
soil - up slightly (4)
browse - improved for key species (4)
herbaceous understory - slightly down (2)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare ground increased from 7% to 14%, while vegetation and litter cover both slightly decreased. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil decreased as a result of these ground cover changes, but it still remains fairly high at 3.5:1 and erosion is minimal. Trend for browse is stable. The key species all appear to have stable populations and for the most part, good vigor and low decadency. The exception is mountain big sagebrush which has 24% of its population classified as having poor vigor. Recruitment is good for serviceberry, mountain big sagebrush and bitterbrush, but low for black sagebrush. The key browse component on this site appears to be in good condition. It is not showing as many negative changes as some other browse communities on the unit with the dry conditions of this year. Trend for the herbaceous understory is down due to drought. Sum of nested frequency of perennial grasses and forbs declined by 20% and 53% respectively.

TREND ASSESSMENT
soil - slightly down (2)
browse - stable (3)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 18

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	b289	a200	a195	44	111	78	68	2.40	3.74
G	Agropyron spicatum	-	2	-	-	-	1	-	.03	-
G	Bouteloua gracilis	b13	a-	a-	-	7	-	-	-	-
G	Bromus anomalus	3	-	4	-	2	-	2	-	.01
G	Carex spp.	b99	b93	a41	18	42	41	17	.35	.65
G	Koeleria cristata	19	18	39	21	11	9	15	.15	1.14
G	Poa fendleriana	a-	b192	b205	-	-	66	69	4.03	6.61
G	Poa pratensis	c113	b76	a20	1	51	26	6	1.81	.75
G	Poa secunda	b264	a67	a46	54	87	28	20	.92	.76
G	Sitanion hystrix	-	1	1	1	-	1	-	.00	-
G	Stipa comata	a2	b27	a8	7	1	11	3	.29	.18
G	Stipa lettermani	b20	b25	a2	2	13	9	1	.11	.15
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		822	701	560	148	325	270	201	10.13	14.01
Total for Grasses		822	701	560	148	325	270	201	10.13	14.01
F	Agoseris glauca	a3	b13	a-	-	1	6	-	.03	-
F	Allium cernuum	b24	b17	a-	-	14	8	-	.07	-
F	Antennaria rosea	a1	b22	b34	-	1	10	11	.22	1.04
F	Arabis spp.	4	2	9	-	3	1	4	.00	.07

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Astragalus convallarius	$_{b}$61	$_{a}$34	$_{a}$16	-	30	16	10	.42	.32
F	Astragalus spatulatus	$_{b}$10	$_{a}$-	$_{b}$11	-	3	-	4	-	.71
F	Astragalus tenellus	$_{c}$71	$_{b}$29	$_{a}$6	-	38	14	2	.56	.06
F	Aster spp.	39	47	40	3	16	19	20	.35	.25
F	Astragalus spp.	$_{b}$7	$_{a}$-	$_{a}$-	12	3	-	-	-	-
F	Balsamorhiza hookeri	$_{b}$23	$_{ab}$30	$_{a}$7	6	12	12	5	.40	.07
F	Castilleja chromosa	$_{b}$13	$_{b}$20	$_{a}$-	4	6	9	-	.26	-
F	Castilleja linariaefolia	$_{a}$4	$_{b}$22	$_{a}$5	-	3	10	2	.18	.03
F	Calochortus nuttallii	$_{a}$-	$_{b}$39	$_{a}$1	-	-	17	1	.49	.00
F	Chaenactis douglasii	1	3	3	-	1	2	1	.03	.03
F	Cirsium undulatum	14	9	7	-	8	5	4	.07	.09
F	Collomia linearis (a)	-	$_{b}$27	$_{a}$-	-	-	13	-	.16	-
F	Comandra pallida	53	50	27	-	23	22	13	.21	.36
F	Cryptantha spp.	-	-	-	2	-	-	-	-	-
F	Collinsia parviflora (a)	-	35	9	-	-	15	4	.29	.07
F	Crepis acuminata	$_{a}$14	$_{b}$43	$_{a}$9	-	7	23	4	.32	.07
F	Cymopterus spp.	$_{a}$2	$_{b}$57	$_{a}$-	-	1	28	-	.16	-
F	Cynoglossum officinale	-	2	-	-	-	1	-	.00	-
F	Eriogonum alatum	7	28	9	-	4	11	5	.10	.07
F	Erigeron eatonii	$_{c}$97	$_{b}$55	$_{a}$13	22	41	22	5	.53	.10
F	Eriogonum umbellatum	5	14	9	2	3	6	3	.27	.09
F	Euphorbia brachycera	1	-	-	2	1	-	-	-	-
F	Geranium richardsonii	-	1	-	-	-	1	-	.03	-
F	Hymenoxys acaulis	$_{b}$24	$_{ab}$4	$_{a}$1	-	9	3	1	.06	.03
F	Lesquerella spp.	3	-	-	-	1	-	-	-	-
F	Linum lewisii	3	-	-	-	1	-	-	-	-
F	Lithospermum spp.	$_{b}$14	$_{ab}$8	$_{a}$5	-	8	3	2	.01	.03
F	Lupinus argenteus	$_{b}$77	$_{a}$54	$_{a}$56	22	39	26	28	.98	.89
F	Lychnis drummondii	-	5	3	-	-	2	1	.01	.03
F	Lygodesmia grandiflora	-	1	-	-	-	1	-	.01	-
F	Machaeranthera canescens	-	-	4	-	-	-	1	-	.00
F	Orthocarpus luteus (a)	$_{b}$11	$_{b}$23	$_{a}$-	2	5	11	-	.17	-
F	Penstemon caespitosus	10	10	7	2	5	6	4	.10	.09
F	Penstemon dolius	$_{b}$8	$_{b}$7	$_{a}$-	-	3	4	-	.21	-
F	Penstemon spp.	23	28	-	3	13	13	-	.16	-
F	Penstemon pachyphyllus	-	1	8	-	-	1	3	.01	.21
F	Petradoria pumila	$_{b}$59	$_{a}$24	$_{a}$33	26	28	9	13	.72	.70
F	Phlox austromontana	$_{b}$93	$_{b}$71	$_{a}$34	32	40	27	17	.94	1.39

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Phlox longifolia	$_{b}$53	$_{b}$63	$_{a}$9	8	21	25	4	.22	.09
F	Physaria spp.	-	3	-	-	-	1	-	.00	-
F	Polygonum douglasii (a)	-	16	-	-	-	7	-	.03	-
F	Potentilla gracilis	18	17	7	3	11	11	3	.13	.04
F	Schoencrambe linifolia	-	3	-	-	-	1	-	.00	-
F	Senecio multilobatus	$_{b}$70	$_{a}$6	$_{a}$5	7	33	2	3	.01	.01
F	Sphaeralcea coccinea	31	20	19	8	13	10	10	.10	.41
F	Taraxacum officinale	16	16	10	-	7	5	5	.05	.07
F	Trifolium gymnocarpon	-	-	3	-	-	-	1	-	.03
F	Viguiera multiflora	3	-	-	3	1	-	-	-	-
F	Zigadenus elegans	-	3	-	-	-	1	-	.00	-
Total for Annual Forbs		11	101	9	0	5	46	4	0.66	0.07
Total for Perennial Forbs		959	881	410	175	452	394	190	8.54	7.45
Total for Forbs		970	982	419	175	457	440	194	9.21	7.52

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 18

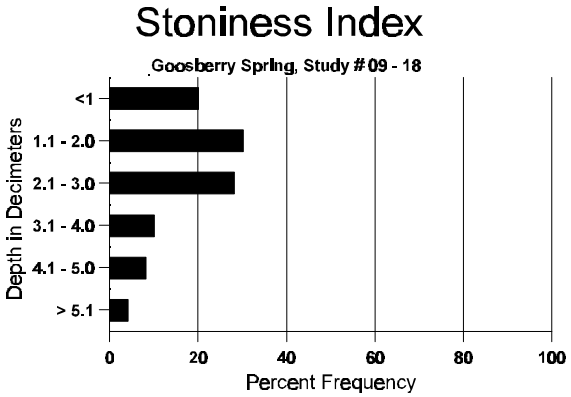
Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	48	51	6.88	6.53
B	Artemisia nova	43	35	4.39	3.34
B	Artemisia tridentata vaseyana	64	67	8.00	6.43
B	Chrysothamnus depressus	4	5	.06	.16
B	Chrysothamnus viscidiflorus lanceolatus	57	44	2.43	1.68
B	Echinocereus spp.	2	1	.01	.03
B	Eriogonum corymbosum	1	0	.15	-
B	Gutierrezia sarothrae	17	17	.18	.16
B	Mahonia repens	1	1	.18	-
B	Purshia tridentata	19	16	2.84	3.32
B	Quercus gambelii	0	1	-	-
B	Ribes cereum cereum	1	0	.03	-
B	Symphoricarpos oreophilus	63	70	11.79	10.39
B	Tetradymia canescens	5	3	.03	.00
Total for Browse		325	311	36.99	32.08

BASIC COVER --
Herd unit 09 , Study no: 18

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	356	345	8.50	13.00	50.28	48.70
Rock	196	163	6.50	9.00	11.72	12.62
Pavement	130	144	2.25	4.50	.95	2.19
Litter	390	378	54.75	57.00	48.87	47.49
Cryptogams	4	16	1.75	0	.01	.16
Bare Ground	186	209	25.50	16.50	7.05	14.61

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 18, Study Name: Gooseberry

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
14.61	52.0 (11.47)	7.0	37.9	20.8	41.3	2.2	4.8	240.0	0.8



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 18

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	2	-	122	N/A
Elk	20	10	618	48 (117)
Deer	12	7	218	17 (41)
Cattle	4	1	87	7 (18)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 18

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
S	82	-	-	2	-	-	-	-	-	-	2	-	-	-	133			2
	88	22	-	-	3	-	-	-	-	-	25	-	-	-	1666			25
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
	00	3	-	-	1	-	-	-	-	-	4	-	-	-	80			4
Y	82	-	1	3	-	-	2	-	-	-	5	1	-	-	400			6
	88	15	8	6	2	1	-	2	-	-	27	3	3	1	2266			34
	95	12	3	1	-	-	-	-	-	-	16	-	-	-	320			16
	00	11	2	-	-	-	-	-	-	-	13	-	-	-	260			13
M	82	3	4	9	-	5	2	-	-	-	21	2	-	-	1533	45	18	23
	88	2	3	3	1	-	-	-	2	-	11	-	-	-	733	47	31	11
	95	16	11	5	4	3	6	-	-	-	45	-	-	-	900	35	41	45
	00	11	3	15	4	11	4	1	-	-	49	-	-	-	980	33	34	49
D	82	-	-	2	-	-	-	1	-	-	2	-	1	-	200			3
	88	-	3	-	1	-	-	-	-	-	4	-	-	-	266			4
	95	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	2	-	2	3	-	-	-	3	-	-	4	140			7
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	31%	56%	03%	+35%
'88	31%	18%	08%	-62%
'95	27%	21%	00%	+10%
'00	26%	35%	06%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	2133	Dec:	9%
	'88	3265		8%
	'95	1240		2%
	'00	1380		10%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	1	-	-	1	-	-	-	66			1
	95	-	-	-	10	-	-	-	-	-	10	-	-	-	200			10
	00	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10
Y	82	11	1	-	-	-	-	-	-	-	12	-	-	-	800			12
	88	11	2	-	-	-	-	-	-	-	13	-	-	-	866			13
	95	54	5	1	-	-	-	-	-	-	60	-	-	-	1200			60
	00	1	1	-	-	-	-	-	-	-	2	-	-	-	40			2
M	82	2	11	1	-	-	-	-	-	-	13	-	1	-	933	12	15	14
	88	4	5	-	1	-	-	-	-	-	10	-	-	-	666	9	14	10
	95	41	91	10	3	-	-	-	-	-	145	-	-	-	2900	10	21	145
	00	124	3	-	2	-	-	-	-	-	129	-	-	-	2580	12	20	129
D	82	1	1	1	-	-	-	-	-	-	1	-	2	-	200			3
	88	3	1	-	-	-	-	-	-	-	1	-	1	2	266			4
	95	4	7	2	-	-	-	-	-	-	3	-	-	10	260			13
	00	13	-	1	-	-	-	-	-	-	9	-	-	5	280			14
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	260			13
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	45%	07%	10%	- 7%
'88	30%	00%	11%	+59%
'95	47%	06%	05%	-33%
'00	03%	.68%	03%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	1933	Dec:		10%
'88	1798			15%
'95	4360			6%
'00	2900			10%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	82	5	2	-	1	-	-	-	-	-	8	-	-	-	533			8
	88	4	1	-	1	-	-	-	-	-	6	-	-	-	400			6
	95	2	3	-	1	1	-	-	-	-	7	-	-	-	140			7
	00	9	3	-	3	-	-	-	-	-	10	-	5	-	300			15
M	82	17	9	2	-	5	-	-	-	-	30	1	2	-	2200	18	16	33
	88	23	5	-	-	-	-	-	-	-	27	-	1	-	1866	18	14	28
	95	29	62	10	2	1	-	-	-	-	98	-	6	-	2080	21	29	104
	00	73	15	3	-	-	-	-	-	-	72	-	19	-	1820	21	27	91
D	82	3	4	5	-	-	-	-	-	-	-	-	11	1	800			12
	88	6	4	1	-	-	-	1	-	-	9	-	3	-	800			12
	95	3	6	-	1	-	-	-	-	-	5	-	-	5	200			10
	00	6	3	2	1	-	-	-	-	-	8	-	-	4	240			12
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	240			12

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	38%	13%	26%	-13%
'88	22%	02%	09%	-21%
'95	60%	08%	09%	- 2%
'00	18%	04%	24%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	3533	Dec:	23%
	'88	3066		26%
	'95	2420		8%
	'00	2360		10%

Chrysothamnus depressus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	7	-	-	-	-	-	-	-	-	7	-	-	-	466			7
	95	1	-	-	2	-	-	-	-	-	3	-	-	-	60			3
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	8	-	-	-	-	-	-	5	-	3	-	533	2	6	8
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	4	5	1
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	6	12	2
	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160	4	9	8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	100%	38%	- 0%
'88	00%	00%	00%	-81%
'95	00%	00%	00%	+44%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	533	Dec:	-
	'88	532		-
	'95	100		-
	'00	180		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus lanceolatus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	4	1	2	-	-	-	-	-	-	6	-	1	-	466			7
	88	69	-	-	-	-	-	1	-	-	70	-	-	-	4666			70
	95	26	-	-	1	-	-	-	-	-	27	-	-	-	540			27
	00	32	-	-	-	-	-	-	-	-	32	-	-	-	640			32
M	82	6	9	37	1	4	-	-	-	-	41	3	13	-	3800	8	12	57
	88	29	1	-	-	-	-	1	-	-	31	-	-	-	2066	10	12	31
	95	117	1	-	15	1	-	-	-	-	134	-	-	-	2680	12	13	134
	00	56	4	2	9	-	1	-	-	-	72	-	-	-	1440	9	10	72
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	-	-	1	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	1	3	-	-	-	-	-	-	4	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	22%	61%	22%	+37%
'88	.98%	00%	.98%	-53%
'95	01%	00%	00%	-33%
'00	05%	06%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	4266	Dec:		0%
'88	6798			1%
'95	3220			0%
'00	2160			4%

Echinocereus spp.																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	2	4	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	-50%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	0	Dec:	-
'88	0		-
'95	40		-
'00	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum corymbosum																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	7	12	2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	40		-
	'00	0		-

Gutierrezia sarothrae																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	22	-	-	-	-	-	-	-	-	22	-	-	-	440	8	10	22
	00	50	-	-	-	-	-	-	-	-	50	-	-	-	1000	4	5	50
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+44%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	580		-
	'00	1040		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Mahonia repens																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	5	6	2
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	-	-	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+33%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	40		-
	'00	60		-

Purshia tridentata																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	2	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	1	-	1	-	-	-	-	-	-	2	-	-	-	40			2
M	82	-	-	4	-	-	1	-	-	-	5	-	-	-	333	13	19	5
	88	-	-	4	-	-	-	-	-	-	4	-	-	-	266	17	23	4
	95	8	6	1	-	9	-	-	-	-	24	-	-	-	480	16	38	24
	00	10	3	-	-	2	4	-	-	-	19	-	-	-	380	19	41	19
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	100%	00%	+17%
'88	33%	67%	00%	+23%
'95	62%	04%	00%	-19%
'00	24%	24%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	333	Dec:	0%
	'88	399		0%
	'95	520		4%
	'00	420		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Quercus gambelii																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	-	-	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	80		-

Ribes cereum cereum																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20	29	52	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	20		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	82	6	-	-	-	-	-	-	-	-	6	-	-	-	400			6
	88	22	-	-	-	-	-	12	-	-	31	-	3	-	2266			34
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	00	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
Y	82	41	6	-	12	-	-	-	-	-	51	8	-	-	3933			59
	88	128	6	-	1	-	-	4	-	-	134	-	5	-	9266			139
	95	71	5	10	6	-	-	-	-	-	92	-	-	-	1840			92
	00	37	2	-	-	-	-	-	-	-	39	-	-	-	780			39
M	82	67	55	8	20	-	-	-	-	-	129	17	4	-	10000	19	23	150
	88	53	3	1	10	-	-	3	-	-	70	-	-	-	4666	18	17	70
	95	75	40	2	11	-	-	-	-	-	128	-	-	-	2560	16	28	128
	00	159	-	-	14	-	-	-	-	-	173	-	-	-	3460	15	32	173
D	82	-	3	-	-	-	-	-	-	-	-	-	3	-	200			3
	88	1	1	-	-	-	-	-	-	-	1	-	1	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	30%	04%	03%	- 0%
'88	05%	.47%	03%	-69%
'95	20%	05%	00%	- 4%
'00	.94%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	14133	Dec:	1%
	'88	14065		1%
	'95	4400		0%
	'00	4240		0%

Tetradymia canescens																		
Y	82	-	-	1	-	-	-	-	-	-	1	-	-	-	66			1
	88	6	-	-	1	-	-	-	-	-	7	-	-	-	466			7
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	2	1	-	-	-	-	-	-	-	3	-	-	-	200	4	3	3
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140	9	8	7
	00	-	-	1	-	-	-	-	-	-	1	-	-	-	20	6	6	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	100%	00%	+90%
'88	10%	00%	00%	-64%
'95	00%	00%	00%	-75%
'00	00%	33%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	66	Dec:	-
	'88	666		-
	'95	240		-
	'00	60		-

Trend Study 9-19-00

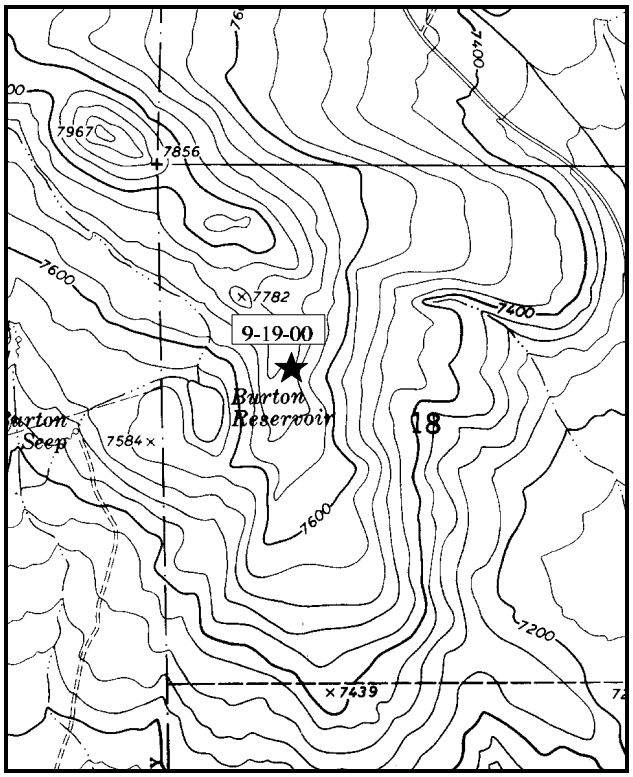
Study site name: Mosby Mountain South . Range type: Mixed Mountain Brush .

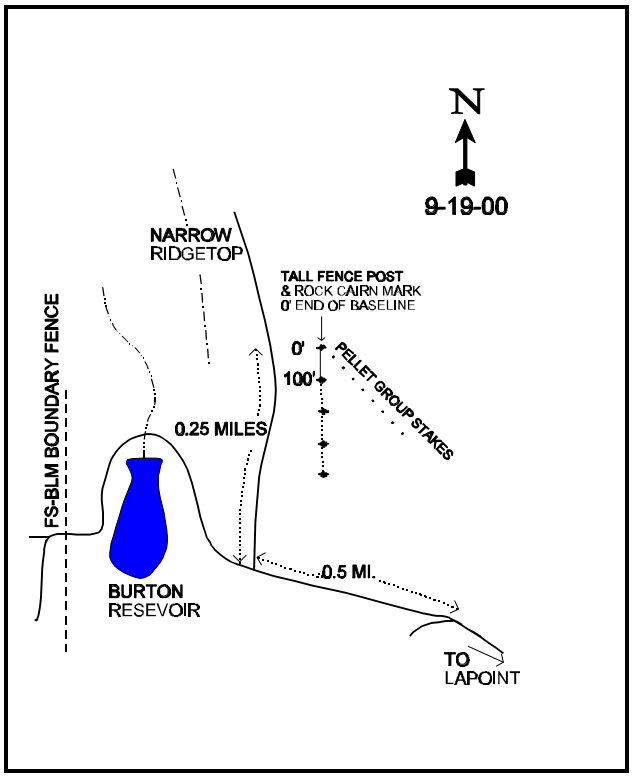
Compass bearing: frequency baseline 167°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Just east of Lapoint, turn north from highway 121. Go 6.9 miles to a fork, keep left toward Mosby Mountain. Proceed 4.8 miles and turn left onto a dirt road heading west. Go 0.15 miles to a 3-way intersection, bear left on the main road. Continue 0.45 miles to a fork, stay left. Go 0.2 miles to another fork, stay to the right. Go 0.5 miles to an intersection on the ridge above Burton Reservoir. Drive 0.25 miles north on a very rocky road to the study site. A tall fencepost which marks the location of a pellet group transect is also the 0-foot baseline stake. It is marked by browse tag #7870. The frequency baseline stakes are short green fenceposts.





Map Name: Lake Mountain Diagrammatic Sketch

Township 3S Range 19E ,Section 18 UTM 4490148.529 N, 598272.521 E

DISCUSSION

Trend Study No. 9-19 (12-8)

The Mosby Mountain South study was established in 1988 to sample a key area that was missed in 1982. The site is located on a narrow ridge top which drops off sharply to Burton Reservoir to the west and a sagebrush and pinyon-juniper valley to the east. The slope at the site is gentle (2-3%), with a southeast aspect. Elevation is about 7,600 feet. A large fire burned the entire area after the initial reading in 1988, where much of the sagebrush was eradicated. Springs are common in the area and most have been developed for cattle. Evidence of sage grouse was observed on this site during study establishment. Sage grouse droppings were sampled in the pellet group transect that was read in 2000. According to Forest Service personnel, the area between this study and study #9-14 (Red Pine Canyon) is an important wintering area for several hundred elk. Pellet group transect data taken directly on the site in 2000 estimate light use for both elk and deer. Elk use is estimated at 15 days use/acre (36 edu/ha) and deer use at 7 days use/acre (17 ddu/ha). This estimated light use may be due to the fact that the past several winters have been mild and animals may not have had to use the site as heavily as in the past. Quadrat frequency of deer and elk pellet groups is much lower in 2000 compared to 1995. Cattle were on the site, as well as the surrounding area in 2000 when the site was read. However, it was noted that most of the cattle were bunched closer to the reservoir about ½ mile away. Cattle use directly on the site is estimated at 9 cow days use/acre (22 cdu/ha).

The soil is very rocky and has a sandy loam texture. Rocks of all sizes are distributed throughout the soil profile and continuously over the surface. They are cobble type rocks from alluvial deposits off of the Uinta mountains. Effective rooting depth is estimated at about 7 inches due to the rocky profile. However, due to the presence of deep rooted shrubs, shrub roots apparently are able to penetrate down through the rock to deeper levels. The estimate of about 17% rock cover was moderately high in 1988, but this increased after the fire to 26% in 1995 and 2000. There was a considerable amount of litter cover (67%) in addition to the extensive shrub cover in 1988, providing good soil protection. Litter cover declined after the fire. It is estimated at 46% in 1995, decreasing to 37% in 2000. Percent bare ground was low at 4% in 1995, increasing to 10% in 2000.

Mountain big sagebrush is currently the dominant shrub on this site as it contributes 32% of the total browse cover. The population appeared stable in 1988 with an estimated 7,533 plants per acre. The proportion of decadent plants (34%) was offset by the high proportion of young (32%) and seedlings (3%). Mountain big sagebrush cover was estimated at 20% in 1988. At this elevation, the sagebrush showed evidence of only light to moderate hedging. Black sagebrush was abundant in 1988 and density increased where soils were more shallow. It showed only light to moderate hedging. Bitterbrush and serviceberry were scattered throughout the area at relatively lower densities, although bitterbrush was more abundant. These species were utilized to a greater extent by mule deer and the majority of the plants appeared heavily hedged. The most preferred browse species showed evidence of stress from drought and insect damage, while the big sagebrush appeared vigorous.

After the fire, density of all shrub species declined but none were lost. Mountain big sagebrush density dropped from 7,533 plants/acre before the fire, to 1,380 in 1995 and 1,280 in 2000 following the fire. Some of this difference could also be the result of the greatly increased sampled size used following the 1988 reading which better estimates shrub populations that have clumped and/or discontinuous distributions. Seedlings and young plants have been few since the fire. Percent decadency was high in both 1988 (34%) and 1995 (30%), but greatly decreased in 2000 to only 5%. Vigor has been good for all readings. Use has decreased since 1995. Currently use is light to moderate. Leader growth averages about 3 inches in 2000, but seed production is high on big sagebrush.

Black sagebrush is estimated at 240 plants/acre and 120 plants/acre in 1995 and 2000 following the fire. Use remains moderate to heavy following fire. Percent decadency has steadily declined from a high of 56% in 1988 (drought year and pre-fire) to 17% in 1995, and 0% in 2000. Bitterbrush density has remained about the same

both before and after the fire. Currently ('00), bitterbrush is estimated at 380 plants/acre, with high recruitment (21%), good vigor, and no decadency. Use is mostly heavy. This should be watched in the future as the low density may accentuate the heavy use. Average leader growth is about 3 inches in 2000, with moderate seed production on bitterbrush. Serviceberry is currently estimated at 220 plants/acre. The entire population in 1995 and 2000 consist of mature plants that show moderate to heavy use.

During the initial reading in 1988, a significant amount of cheatgrass in the understory was reported. In 1995, cheatgrass had the highest nested frequency of any species and accounted for 21% of the grass cover. With drought in 2000, cheatgrass was sampled in only 2 quadrats. Perennial grasses consist of a mix of native and seeded species and include: several wheatgrass's (crested, thickspike, intermediate and bluebunch); needle-and-thread; squirreltail; Sandberg, Kentucky, and mutton bluegrass; and a Carex. Crested wheatgrass and needle-and-thread are the dominate species. Both remained at stable frequencies in 2000. As a group, perennial grasses decreased in sum of nested frequency in 2000 by 17%, but increased in cover from 17% to 19%. Utilization was moderate to heavy on most species in 2000.

Forbs contribute about 25% of the total vegetative cover at the site in 2000. Perennial species are moderately diverse, but only hairy goldaster is common. This species provides nearly 7% average cover in 2000, which significantly increased in nested frequency. Silvery lupine is also moderately abundant. Annual forbs are very infrequent, especially in 2000 with the dry conditions. Perennial forbs slightly increased in sum of nested frequency in 2000, which is surprising as perennial forbs have decreased on most other sites in 2000 due to drought.

1995 TREND ASSESSMENT

The soil trend is stable. Litter cover declined due to the fire but there is still adequate soil protection. Currently, percent bare ground is only 4%. The browse trend is down with reduced densities of all species encountered in 1988. The key species, mountain big sagebrush, declined in density and has a moderately high rate of decadency (34%). This species is not tolerant of fire, as some of the other species are. Recruitment is also poor with no seedlings encountered and only 140 young plants/acre were estimated. Vigor was good on most other browse, with the density expected to eventually increase in time. Trend for the preferred bitterbrush is slightly up due to a consistent mature population, low decadency, reduced heavy use, and more tolerance to fire. Trend for the herbaceous understory is up with increased sum of nested frequency for grasses and forbs.

TREND ASSESSMENT
soil - stable (3)
browse - down due to fire, but will increase in time (1)
herbaceous understory - up (5)

2000 TREND ASSESSMENT

Trend for soil is slightly down. Bare soil increased from 4% to 10%, while litter cover decreased from 46% to 37% in 2000. Rock cover remains high at 26%. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil decreased from 6:1 to 3:1. Trend for browse is stable. All of the key and preferred browse species show stable to slightly increasing populations in 2000. Recruitment is low for all species except bitterbrush, but all species show low and improving decadency rates and good vigor. Trend for the herbaceous understory is stable. Sum of nested frequency of perennial grasses as a group decreased in 2000, but the dominant species, crested wheatgrass and needle-and-thread, remained at fairly stable frequencies. Also, cheatgrass was nearly non-existent in 2000 due to drought. Sum of nested frequency of perennial forbs actually slightly increased with drought in 2000 which offset some of the losses of the grasses. This increase is the exception in this unit.

TREND ASSESSMENT
soil - slightly down (2)
browse - stable (3)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 19

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron cristatum	a-	b144	b159	-	54	61	3.26	5.83
G	Agropyron dasystachyum	a-	cb74	b4	-	26	3	1.99	.04
G	Agropyron intermedium	a-	b32	a2	-	11	1	.32	.00
G	Agropyron spicatum	b93	a31	a16	41	12	5	.61	.36
G	Bouteloua gracilis	b27	a3	a-	14	1	-	.03	-
G	Bromus tectorum (a)	-	b298	a5	-	91	2	3.60	.03
G	Carex spp.	7	9	11	4	4	7	.02	.10
G	Poa fendleriana	-	4	22	-	2	6	.03	.30
G	Poa pratensis	ab25	b40	a5	10	16	2	.88	.18
G	Poa secunda	b66	a2	a18	31	1	6	.00	.30
G	Sitanion hystrix	b155	a40	a18	64	18	8	.31	.51
G	Sporobolus cryptandrus	a-	ab2	b7	-	1	3	.00	.04
G	Stipa comata	a31	b181	b205	14	66	68	5.77	11.26
Total for Annual Grasses		0	298	5	0	91	2	3.60	0.03
Total for Perennial Grasses		404	562	467	178	212	170	13.25	18.95
Total for Grasses		404	860	472	178	303	172	16.86	18.99
F	Allium spp.	-	5	-	-	2	-	.01	-
F	Arabis spp.	7	3	2	4	1	1	.00	.03
F	Artemisia ludoviciana	-	-	3	-	-	1	-	.15
F	Astragalus purshii	b8	a-	a-	3	-	-	-	-
F	Aster spp.	a-	ab4	b10	-	2	5	.01	.10
F	Balsamorhiza hookeri	a-	b3	a-	-	3	-	.04	-
F	Chenopodium leptophyllum (a)	-	b14	a-	-	5	-	.02	-
F	Collomia linearis (a)	-	b29	a-	-	15	-	.07	-
F	Comandra pallida	3	-	1	1	-	1	-	.03
F	Collinsia parviflora (a)	-	8	2	-	3	1	.01	.00
F	Cryptantha spp.	-	1	-	-	1	-	.00	-
F	Descurainia pinnata (a)	-	b8	a-	-	3	-	.01	-
F	Draba spp. (a)	-	1	-	-	1	-	.03	-
F	Erigeron flagellaris	-	1	2	-	1	2	.03	.03

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Eriogonum racemosum	$_{b}$25	$_{ab}$6	$_{a}$3	10	4	2	.16	.06
F	Heterotheca villosa	$_{a}$18	$_{b}$142	$_{c}$171	9	59	68	4.69	6.92
F	Hymenoxys acaulis	2	1	-	2	1	-	.00	-
F	Lappula occidentalis (a)	-	3	-	-	2	-	.01	-
F	Lepidium densiflorum (a)	-	$_{b}$44	$_{a}$2	-	21	1	.15	.03
F	Lithospermum spp.	-	-	4	-	-	2	-	.01
F	Lupinus argenteus	$_{b}$13	$_{a}$41	$_{c}$72	5	21	32	1.75	2.72
F	Oenothera pallida	1	-	-	1	-	-	-	-
F	Penstemon spp.	$_{ab}$5	$_{b}$5	$_{a}$-	2	3	-	.04	-
F	Petradoria pumila	$_{b}$8	$_{ab}$3	$_{a}$-	4	1	-	.15	-
F	Phlox longifolia	$_{b}$9	$_{a}$-	$_{a}$-	3	-	-	-	-
F	Polygonum douglasii (a)	-	$_{b}$29	$_{a}$-	-	14	-	.07	-
F	Sedum lanceolatum	1	-	-	1	-	-	-	-
F	Senecio multilobatus	1	4	8	1	2	3	.01	.06
F	Sphaeralcea coccinea	5	11	2	2	4	2	.09	.01
F	Taraxacum officinale	-	3	-	-	2	-	.01	-
F	Tragopogon dubius	$_{a}$-	$_{b}$10	$_{a}$-	-	7	-	.06	-
Total for Annual Forbs		0	136	4	0	64	2	0.39	0.03
Total for Perennial Forbs		106	243	278	48	114	119	7.09	10.14
Total for Forbs		106	379	282	48	178	121	7.49	10.18

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 19

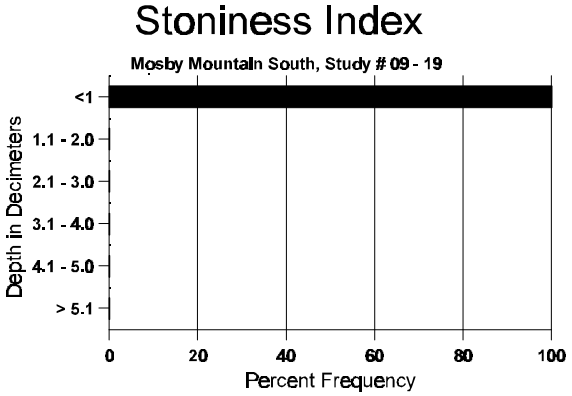
Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Amelanchier utahensis	10	11	1.94	2.63
B	Artemisia nova	7	4	.18	.03
B	Artemisia tridentata vaseyana	33	34	2.27	3.00
B	Chrysothamnus nauseosus graveolens	0	0	-	.03
B	Chrysothamnus viscidiflorus lanceolatus	3	0	.15	-
B	Eriogonum heracleoides	3	6	.66	.41
B	Gutierrezia sarothrae	12	23	.31	.63
B	Opuntia spp.	19	24	.41	.41
B	Pediocactus simpsonii	6	3	.45	.03
B	Purshia tridentata	14	19	1.16	2.05
Total for Browse		107	124	7.55	9.25

BASIC COVER --
Herd unit 09 , Study no: 19

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '88	Average Cover % '95	Average Cover % '00
Vegetation	374	347	7.50	40.06	42.06
Rock	323	280	16.50	26.87	26.17
Pavement	90	160	1.00	2.96	5.90
Litter	383	375	67.00	46.25	37.31
Cryptogams	23	2	0	.12	.15
Bare Ground	127	230	8.00	3.95	10.04

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 19, Study Name: Mosby Mountain South

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
6.83	67.4 (8.66)	6.6	72.0	13.4	14.6	8.0	19.6	208.0	0.6



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 19

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	'00	'00
Rabbit	3	13	165	N/A
Grouse	-	1	35	N/A
Elk	30	12	191	15 (37)
Deer	19	6	87	7 (17)
Cattle	1	7	104	9 (22)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 19

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
Y	88	1	2	6	-	-	-	-	-	-	5	-	4	-	600			9
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	2	7	2	-	-	-	-	-	-	10	-	1	-	220	25	34	11
	00	3	1	1	1	4	1	-	-	-	11	-	-	-	220	27	47	11
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	22%	67%	44%	-63%
'95	64%	18%	09%	+ 0%
'00	45%	18%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	600	Dec:	-
	'95	220		-
	'00	220		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
S	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	12	3	-	-	-	-	-	-	-	15	-	-	-	1000			15
	95	-	2	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	1	3	-	-	-	-	-	-	-	4	-	-	-	266	12	20	4
	95	-	4	1	-	1	2	-	-	-	8	-	-	-	160	7	18	8
	00	1	1	2	2	-	-	-	-	-	6	-	-	-	120	18	28	6
D	88	8	14	2	-	-	-	-	-	-	22	-	1	1	1600			24
	95	-	1	1	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	47%	05%	05%	-92%
'95	67%	33%	00%	-50%
'00	17%	33%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	2866	Dec:	56%
	'95	240		17%
	'00	120		0%

Artemisia tridentata vaseyana																		
S	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	88	14	22	-	-	-	-	-	-	-	36	-	-	-	2400			36
	95	5	1	1	-	-	-	-	-	-	7	-	-	-	140			7
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	23	14	1	1	-	-	-	-	-	38	1	-	-	2600	14	21	39
	95	12	29	-	-	-	-	-	-	-	41	-	-	-	820	10	16	41
	00	34	21	-	3	-	3	-	-	-	61	-	-	-	1220	14	23	61
D	88	18	17	3	-	-	-	-	-	-	36	-	1	1	2533			38
	95	-	20	1	-	-	-	-	-	-	20	-	-	1	420			21
	00	1	1	-	-	1	-	-	-	-	2	-	-	1	60			3
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	900			45
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	47%	04%	02%	-82%
'95	72%	03%	01%	- 7%
'00	36%	05%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	7533	Dec:	34%
	'95	1380		30%
	'00	1280		5%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ceanothus fendleri																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	31	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	10	41	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

Chrysothamnus nauseosus graveolens																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	24	24	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	27	41	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	0		-
	'00	0		-

Chrysothamnus viscidiflorus lanceolatus																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	12	17	3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	17	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	60		-
	'00	0		-

Eriogonum heracleoides																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140	5	22	7
	00	8	1	-	-	-	-	-	-	-	9	-	-	-	180	3	17	9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	+22%
'00	11%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	140		-
	'00	180		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	29	-	-	-	-	-	-	-	-	29	-	-	-	1933	6	6	29
	95	21	-	-	-	-	-	-	-	-	21	-	-	-	420	7	9	21
	00	99	-	-	-	-	-	-	-	-	99	-	-	-	1980	6	8	99
D	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	-78%
'95	00%	00%	00%	+78%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	1999	Dec:	3%
	'95	440		0%
	'00	1980		0%

Opuntia spp.																		
S	88	9	-	-	-	-	-	-	-	-	9	-	-	-	600			9
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	25	-	-	-	-	-	-	-	-	23	-	2	-	1666			25
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	2	10	1
	95	22	-	-	-	-	-	-	-	-	22	-	-	-	440	3	10	22
	00	33	-	-	3	-	-	-	-	-	36	-	-	-	720	2	10	36
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	08%	-67%
'95	00%	00%	00%	+28%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	1732	Dec:	0%
	'95	580		0%
	'00	800		3%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pediocactus simpsonii																		
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80	2	3	4
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	1	3	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	00%	00%	
'95	00%	00%	00%	-50%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	0	Dec:	-
	'95	120		-
	'00	60		-

Purshia tridentata																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	1	-	1	-	-	-	-	-	-	2	-	-	-	133			2
	95	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	1	3	-	-	-	-	-	-	4	-	-	-	80			4
M	88	-	-	5	-	-	-	-	-	-	5	-	-	-	333	12	43	5
	95	2	6	5	-	-	2	-	-	-	15	-	-	-	300	7	26	15
	00	-	1	5	-	-	8	1	-	-	15	-	-	-	300	7	33	15

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'88	00%	86%	00%	-31%
'95	44%	44%	00%	+16%
'00	11%	84%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'88	466	Dec:	-
	'95	320		-
	'00	380		-

Trend Study 9-20-00

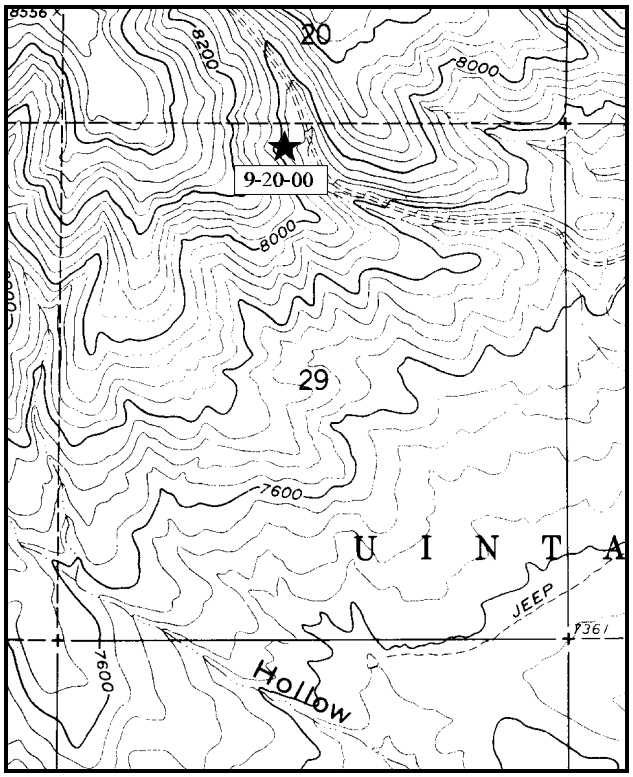
Study site name: Seep Hollow . Range type: Mixed Mountain Brush .

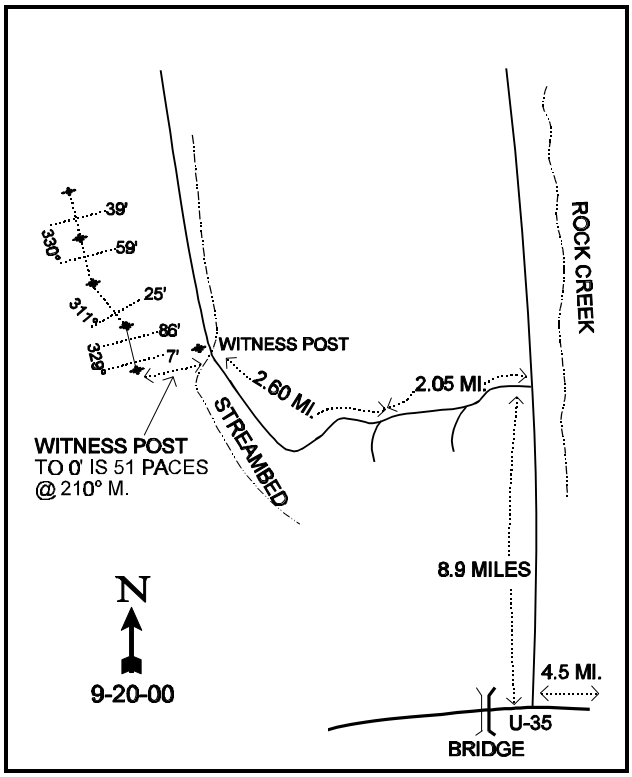
Compass bearing: frequency baseline 329°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (7 & 86ft), line 2 (25ft), line 3 (59ft), line 4 (39ft). No rebar marking belt placement.

LOCATION DESCRIPTION

From highway U-87, turn onto highway U-35 and travel west to the Rock Creek Road, which is just east of mile marker 59 and the bridge over the Duchesne River. Turn right onto Rock Creek Road and go north for 8.95 miles to a road on the left. Turn and travel west 2.05 miles to a fork. Bear right and proceed 2.6 miles to a streambed. From the intersection of the road and the streambed, the 0-foot baseline stake is 65 paces away at the heading of 210°M. The frequency baseline stakes are marked by green fenceposts 12-18 inches in height.





Map Name: Blacktail Mountain Diagrammatic Sketch

Township 1S , Range 6W ,Section 29 UTM 4468680.438 N, 535104.967 E

DISCUSSION

Trend Study No. 9-20 (12-9)

The Seep Hollow trend study used to be in the Currant Creek management unit (17), but is now within the South Slope management unit. This study is on deer and elk winter range in the Seep Hollow-Dry Mountain Hollow area. Elevation is slightly below 8,000 feet on a northeast exposure with a steep 50% to 60% slope. The site may not be accessible to wildlife during severe winters. The range type is mixed mountain brush on land owned by the Ute Indian Tribe. Pellet group transect data taken along the baseline in 2000 estimate 44 deer days use/acre (107 ddu/ha) and 15 elk days use/acre (36 edu/ha).

Soils are sandy loam in texture and very rocky on the surface and throughout the profile. Rocks range in size from a few inches to more than a foot in diameter. Due to the rockiness, effective rooting depth is estimated at only 8 inches. Excluding rock, litter and vegetative cover are excellent and considering steepness of the slope, erosion is minimal. Bare ground is quite low at about 10% of the ground surface.

Browse dominates the site by providing 67% of the total vegetative cover in 2000. Key species include: serviceberry, mountain big sagebrush, true mountain mahogany and bitterbrush. Serviceberry currently (‘00) provides 32% of the browse cover with an estimated density of 1,400 plants/acre. Density increased since 1995 due to the increase in young plants from 280 plants/acre to 560, representing a 40% rate of recruitment. Mature plants also slightly increased from 640 to 820 plants/acre in 2000. They average about 4 feet in height with a 5 foot crown. A small portion of the mature serviceberry were classified as unavailable due to height. In 2000, percent decadency is low at 1%, vigor is good and utilization is light to moderate with only 3% heavy use.

Mountain big sagebrush density has remained fairly stable over all readings. Sagebrush density is currently estimated at 2,340 plants/acre with moderate decadency at 26%. This level of decadency is an increase from 14% in 1995, but still below the 1988 level of 32%, which was also a drought year. Poor vigor increased from 6% in 1995 to 28% in 2000. Increases in decadency and poor vigor on big sagebrush are drought related and have been documented on many other sagebrush stands in this unit in 2000. Biotic potential (number of seedlings) and recruitment are currently (‘00) low at 1% and 3% respectively. It appears that this population is becoming increasingly mature with limited reproduction. Dead sagebrush numbered 560 plants/acre or 1 dead plant to every 4 live plants in 1995. This ratio improved in 2000 to 1:11. Utilization of mountain big sagebrush is light to moderate with less than 5% of the population showing heavy use in any year.

True mountain mahogany currently (‘00) makes up 15% of the browse cover with an estimated density of 500 plants/acre. Density is lower in 2000 compared to 1995, as young plants decreased from 160 to 40 plants/acre. However, 8% recruitment in 2000 is still good. Its biotic potential (number of seedlings) is also estimated at 8%. Mature plants average about 3 feet in height and width, are moderate to heavily hedged, and display mostly good vigor in 2000. Heavy use increased from 9% of the population in 1995 to 48% in 2000. Decadency remains low at only 4%. Bitterbrush is currently estimated at 720 plants/acre, with nearly all of the population being mature individuals. Recruitment is low at 3%, but no decadent plants were sampled in 2000. Vigor is good. This species displays a prostrate growth form as it averages about 1½ feet in height by a nearly 4 foot crown. Use is moderate, with 22% of the population displaying heavy use in 2000.

The herbaceous understory is dominated by perennial grasses. Bluebunch wheatgrass, needle-and-thread and mutton bluegrass are the most common. All of these species remained at stable frequencies in 2000. Several other species that occur less frequently include: thickspike wheatgrass, a Carex, Sandberg bluegrass and squirreltail. All of these species significantly decreased in nested frequency in 2000 except squirreltail which remained stable. As a group, perennial grasses decreased in sum of nested frequency by 15% in 2000. Utilization of grasses is currently minimal. Forbs are somewhat diverse but relatively scare compared to

grasses. They provided only 5% of the total vegetative cover at the site in 2000. The most common forbs include: biscuitroot, littleleaf alumroot, spring parsley and arrowleaf balsamroot. Perennial forb sum of nested frequency decreased by 32% in 2000 due to drought. Annual forbs had a higher sum of nested frequency in 1995 than perennials did, but were nearly non-existent in 2000 with the dry conditions.

1982 APPARENT TREND ASSESSMENT

Soil and vegetative trend both appear stable. Although the site is on a steep slope, a good vegetative and litter cover limit soil loss. The browse component is in generally good condition and does not suffer from heavy use. A reasonable management objective might be to encourage expansion of true mountain mahogany and antelope bitterbrush. Hopefully, this could be achieved at the expense of low rabbitbrush and pricklypear.

1988 TREND ASSESSMENT

On this steep slope, ground cover is especially important for soil protection. Ground cover percentages are almost unchanged from 1982 and currently soil erosion is not a problem. The community is basically stable, but data comparisons between readings in 1982 and 1988 do indicate a few significant changes. There was a rather large decrease in the number of snowberry encountered on the density plots, but the other large browse species have maintained stable populations. Mountain big sagebrush appears to be more moderately hedged in recent years, in contrast to the lightly hedged growth form reported in 1982. Still, the key browse species have good vigor and adequate recruitment. In the understory, there has been an increase in the frequency and density of western wheatgrass. A decrease in forb density was noted, along with an increase in the number of several small shrubs such as slenderbush eriogonum, Oregon grape, low rabbitbrush and pricklypear cactus.

TREND ASSESSMENT
soil - stable (3)
browse - stable for key species (3)
herbaceous understory - stable (3)

1995 TREND ASSESSMENT

Trend for soil is slightly improved with a decline in percent bare ground from about 14% to almost 4%. Nested frequency of grasses and forbs also increased providing additional soil protection. Trend for key browse species is improving slightly for serviceberry, true mountain mahogany, bitterbrush and snowberry; but stable for the most abundant shrub, mountain big sagebrush which provides 27% of the browse cover. The population of sagebrush is becoming increasingly mature with no seedlings and few young observed. Density of the less desirable shrubs like mountain low rabbitbrush and wyeth eriogonum appear stable. Trend for the herbaceous understory is up with increased sum of nested frequency for perennial grasses and forbs. The 4 most abundant grasses all increased in nested frequency since 1988.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable for sagebrush and slightly up for serviceberry, mountain mahogany, bitterbrush and snowberry (4)
herbaceous understory - up (5)

2000 TREND ASSESSMENT

Trend for soil is stable. Erosion remains minimal due to good protective cover from vegetation and litter. Bare ground increased, but remains quite low at about 10%. The ratio of protective ground cover (vegetation, litter,

and cryptogams) to bare soil decreased, but it still remains high at over 5:1 which indicates well disbursed ground cover. Trend for browse is stable overall. The preferred species: serviceberry, true mountain mahogany and bitterbrush show stable trends with good vigor, low decadency and acceptable levels of use. Mountain big sagebrush shows a slightly downward trend with increased decadency from 14% to 26%, increased poor vigor from 6% to 28% and low recruitment. These downward parameters are drought related and should improve with better precipitation in the future. Trend for the herbaceous understory is slightly down as sum of nested frequency of perennial grasses and forbs decreased in 2000 due to drought.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 20

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	b82	b66	a22	2	33	25	9	.93	.19
G	Agropyron spicatum	157	160	122	52	64	55	43	2.94	4.10
G	Bromus tectorum (a)	-	b14	a2	-	-	6	1	.08	.00
G	Carex spp.	a21	b58	a32	17	12	25	12	1.12	.96
G	Koeleria cristata	9	2	9	2	4	2	4	.04	.36
G	Oryzopsis hymenoides	13	1	1	2	5	1	1	.03	.03
G	Poa fendleriana	122	124	142	35	50	47	51	2.27	4.82
G	Poa secunda	15	23	35	33	8	9	14	.48	.51
G	Sitanion hystrix	a-	b11	ab5	2	-	4	2	.08	.03
G	Stipa comata	68	119	109	41	29	50	46	4.09	5.21
Total for Annual Grasses		0	14	2	0	0	6	1	0.07	0.00
Total for Perennial Grasses		487	564	477	186	205	218	182	12.01	16.23
Total for Grasses		487	578	479	186	205	224	183	12.09	16.24
F	Allium spp.	-	3	-	-	-	1	-	.00	-
F	Antennaria rosea	a-	b11	ab4	-	-	4	2	.07	.06
F	Arabis spp.	2	-	-	7	1	-	-	-	-
F	Artemisia ludoviciana	-	4	3	-	-	2	1	.18	.15
F	Astragalus spp.	-	5	1	1	-	2	1	.01	.00
F	Balsamorhiza sagittata	-	1	2	2	-	1	1	.15	.03
F	Castilleja linariaefolia	17	5	13	-	8	2	7	.06	.52
F	Calochortus nuttallii	a-	b13	a-	-	-	7	-	.04	-
F	Chenopodium leptophyllum (a)	-	2	-	-	-	2	-	.01	-
F	Cirsium spp.	7	7	2	-	4	4	1	.21	.15

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Collomia linearis (a)	-	$_{b}$119	$_{a}$-	-	-	55	-	.62	-
F	Comandra pallida	34	29	28	13	16	12	12	.21	.26
F	Collinsia parviflora (a)	-	$_{b}$244	$_{a}$12	-	-	82	4	1.53	.04
F	Crepis acuminata	$_{a}$-	$_{c}$19	$_{b}$7	-	-	11	4	.21	.07
F	Cryptantha spp.	$_{b}$7	$_{a}$-	$_{a}$-	4	3	-	-	-	-
F	Descurainia pinnata (a)	-	$_{b}$11	$_{a}$-	-	-	5	-	.05	-
F	Draba spp. (a)	-	$_{b}$67	$_{a}$-	-	-	20	-	.20	-
F	Erigeron eatonii	-	1	-	-	-	1	-	.00	-
F	Erigeron flagellaris	4	4	4	-	2	2	2	.04	.18
F	Eriogonum racemosum	$_{a}$-	$_{b}$7	$_{ab}$3	-	-	4	1	.04	.03
F	Eriogonum umbellatum	-	-	7	9	-	-	2	-	.15
F	Gayophytum ramosissimum (a)	-	5	-	-	-	2	-	.01	-
F	Heuchera parvifolia	$_{a}$-	$_{b}$41	$_{b}$24	23	-	18	11	.93	.37
F	Heterotheca villosa	$_{a}$-	$_{a}$-	$_{b}$8	-	-	-	3	-	.16
F	Lappula occidentalis (a)	-	3	-	-	-	2	-	.01	-
F	Lithospermum ruderale	$_{a}$-	$_{b}$5	$_{b}$4	-	-	3	3	.21	.06
F	Lomatium spp.	$_{a}$20	$_{b}$83	$_{ab}$49	22	9	40	19	1.55	.39
F	Lupinus argenteus	-	-	3	-	-	-	1	-	.03
F	Penstemon spp.	$_{b}$11	$_{ab}$3	$_{a}$-	4	4	1	-	.15	-
F	Penstemon procerus	-	11	8	-	-	5	5	.12	.36
F	Petradoria pumila	-	3	1	-	-	1	1	.03	.03
F	Polygonum douglasii (a)	-	$_{b}$20	$_{a}$-	-	-	11	-	.05	-
F	Schoencrambe linifolia	-	-	-	-	-	-	-	-	.03
F	Senecio integerrimus	13	12	12	3	6	6	6	.05	.05
F	Sedum lanceolatum	-	4	-	-	-	2	-	.01	-
F	Senecio multilobatus	-	-	3	-	-	-	1	-	.00
F	Sphaeralcea coccinea	-	2	2	-	-	1	1	.03	.00
F	Stellaria jamesiana	-	4	-	-	-	2	-	.01	-
Total for Annual Forbs		0	471	12	0	0	179	4	2.48	0.04
Total for Perennial Forbs		115	277	188	88	53	132	85	4.36	3.15
Total for Forbs		115	748	200	88	53	311	89	6.84	3.19

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 09 , Study no: 20

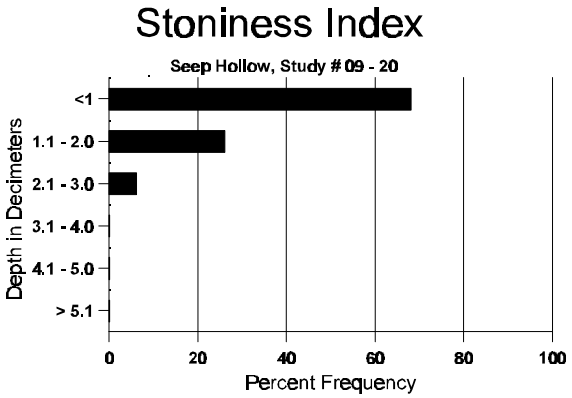
Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Amelanchier alnifolia	30	37	9.44	12.58
B	Artemisia tridentata vaseyana	76	72	8.63	6.60
B	Cercocarpus montanus	24	19	5.23	5.76
B	Chrysothamnus viscidiflorus lanceolatus	37	28	.88	1.20
B	Eriogonum heracleoides	51	50	2.42	2.65
B	Mahonia repens	2	6	.00	.22
B	Opuntia spp.	24	18	.37	.25
B	Pediocactus simpsonii	3	0	.03	-
B	Pinus edulis	0	4	1.04	.56
B	Prunus virginiana	0	0	.03	-
B	Purshia tridentata	20	28	2.42	4.71
B	Symphoricarpos oreophilus	46	42	3.95	4.66
Total for Browse		313	304	34.46	39.23

BASIC COVER --
Herd unit 09 , Study no: 20

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '82	Average Cover % '88	Average Cover % '95	Average Cover % '00
Vegetation	360	343	8.50	7.50	43.34	58.95
Rock	242	215	10.50	14.00	14.42	14.38
Pavement	8	93	0	0	.07	1.13
Litter	394	386	64.25	64.25	60.95	66.43
Cryptogams	42	38	1.25	0	.33	1.05
Bare Ground	123	145	15.50	14.25	4.36	9.90

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 20, Study Name: Seep Hollow

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
8.36	57.6 (9.45)	6.7	73.3	16.2	10.6	4.7	9.6	102.4	0.7



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 20

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	5	3	61	N/A
Elk	9	9	191	15 (37)
Deer	27	15	566	44 (107)

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 20

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	2	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	7	-	-	-	-	-	-	-	-	7	-	-	-	466			7
	88	5	1	-	-	-	-	-	-	-	5	1	-	-	400			6
	95	8	1	-	3	2	-	-	-	-	14	-	-	-	280			14
	00	22	2	-	2	-	-	2	-	-	28	-	-	-	560			28
M	82	3	2	-	-	-	-	-	-	-	5	-	-	-	333	16	14	5
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	56	32	1
	95	15	11	1	-	2	-	-	3	-	32	-	-	-	640	58	75	32
	00	8	4	1	2	11	1	12	2	-	41	-	-	-	820	52	63	41
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	17%	00%	00%	-42%
'88	14%	00%	00%	+49%
'95	35%	02%	00%	+34%
'00	24%	03%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	799	Dec:		0%
'88	466			0%
'95	920			0%
'00	1400			1%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	6	-	-	-	-	-	-	-	-	6	-	-	-	400			6
	95	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	82	31	3	-	-	-	-	-	-	-	31	2	1	-	2266	19	24	34
	88	6	16	-	-	-	-	-	-	-	22	-	-	-	1466	17	22	22
	95	49	45	3	4	3	-	-	-	-	102	-	-	2	2080	21	31	104
	00	70	4	3	6	-	-	-	-	-	61	-	22	-	1660	22	28	83
D	82	-	4	2	-	-	-	-	-	-	-	2	3	1	400			6
	88	8	4	1	-	-	-	-	-	-	11	-	1	1	866			13
	95	4	13	-	-	-	-	-	-	-	12	-	-	5	340			17
	00	19	7	-	1	2	-	2	-	-	18	2	5	6	620			31
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	560			28
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	220			11

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	18%	05%	13%	+ 2%
'88	49%	02%	05%	-11%
'95	51%	02%	06%	- 4%
'00	11%	03%	28%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'82	2666		15%
	'88	2732		32%
	'95	2440		14%
	'00	2340		26%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	2	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	2	6	-	-	-	-	-	-	-	8	-	-	-	160			8
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	82	5	3	-	-	-	-	-	-	-	6	-	2	-	533	33	21	8
	88	-	5	-	-	-	-	-	-	-	5	-	-	-	333	28	39	5
	95	5	11	3	4	3	-	-	-	-	26	-	-	-	520	44	47	26
	00	1	1	4	1	6	7	2	-	-	21	-	1	-	440	36	38	22
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	1	-	-	-	1	-	-	-	20			1
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	38%	00%	25%	-13%
'88	100%	00%	00%	+31%
'95	59%	09%	00%	-26%
'00	28%	48%	04%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	533	Dec:	0%
	'88	466		0%
	'95	680		0%
	'00	500		4%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus lanceolatus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	11	-	-	-	-	-	-	-	-	11	-	-	-	733	11	9	11
	88	10	2	-	-	-	-	-	-	-	12	-	-	-	800	11	11	12
	95	45	-	-	7	-	-	-	-	-	52	-	-	-	1040	15	16	52
	00	37	-	-	3	-	-	1	-	-	39	-	2	-	820	14	13	41
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	2	-	-	-	-	-	4	-	-	-	266			4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	2	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+45%
'88	10%	00%	00%	-20%
'95	00%	00%	00%	-19%
'00	00%	00%	05%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	733	Dec:		0%
'88	1332			20%
'95	1060			0%
'00	860			5%

Eriogonum corymbosum																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	13	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	0	Dec:	-
'88	0		-
'95	0		-
'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum heracleoides																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	27	-	-	-	-	-	-	-	-	21	-	6	-	1800			27
	95	19	-	-	-	-	-	-	-	-	19	-	-	-	380			19
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	82	29	-	-	-	-	-	-	-	-	29	-	-	-	1933	13	10	29
	88	19	-	-	-	-	-	-	-	-	11	-	8	-	1266	5	7	19
	95	109	-	-	8	-	-	-	-	-	117	-	-	-	2340	8	15	117
	00	125	-	-	2	-	-	-	-	-	127	-	-	-	2540	6	9	127
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	3	-	-	-	-	-	-	-	-	-	-	-	3	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+37%
'88	00%	00%	30%	-11%
'95	00%	00%	00%	- 2%
'00	00%	00%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	1933	Dec:	0%
	'88	3066		0%
	'95	2720		0%
	'00	2660		2%

Mahonia repens																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	38	-	-	-	-	-	-	-	-	38	-	-	-	2533			38
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	16	-	-	-	-	-	-	-	-	16	-	-	-	1066	4	6	16
	88	5	-	-	-	-	-	-	-	-	2	-	3	-	333	3	5	5
	95	14	-	-	-	-	-	-	-	-	14	-	-	-	280	5	7	14
	00	16	-	-	-	-	-	-	-	-	16	-	-	-	320	4	5	16

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+63%
'88	00%	00%	07%	-90%
'95	00%	00%	00%	+18%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	1066	Dec:	-
	'88	2866		-
	'95	280		-
	'00	340		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	7	-	-	-	-	-	-	-	-	7	-	-	-	466			7
	88	22	-	-	-	-	-	-	-	-	19	-	3	-	1466			22
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	82	13	-	-	-	-	-	-	-	-	13	-	-	-	866	4	8	13
	88	15	-	-	-	-	-	-	-	-	13	-	2	-	1000	4	9	15
	95	44	-	-	-	-	-	-	-	-	44	-	-	-	880	3	8	44
	00	27	-	-	-	-	-	-	-	-	27	-	-	-	540	2	5	27
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+46%
'88	00%	00%	14%	-61%
'95	00%	00%	00%	-35%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	1332	Dec:	0%
	'88	2466		0%
	'95	960		4%
	'00	620		0%

Pediocactus simpsonii

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	2	4	3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	60		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	69	59	1
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	83	47	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+ 0%
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	66	Dec:		-
'88	66			-
'95	0			-
'00	80			-

Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	1	-	-	2	-	-	-	-	-	3	-	-	-	60			3
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	1	4	-	-	-	-	-	-	-	5	-	-	-	333	12	16	5
	88	2	3	-	-	-	-	-	-	-	5	-	-	-	333	24	21	5
	95	9	11	-	3	1	-	-	-	-	24	-	-	-	480	16	37	24
	00	15	9	4	-	2	4	1	-	-	35	-	-	-	700	17	44	35
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	80%	00%	00%	+28%
'88	57%	00%	00%	+14%
'95	44%	00%	00%	+25%
'00	31%	22%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	333	Dec:	0%
'88	465		14%
'95	540		0%
'00	720		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	2	-	-	-	-	-	2	-	-	-	40			2
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	82	1	-	-	2	-	-	-	-	-	3	-	-	-	200			3
	88	8	2	-	-	-	-	-	-	-	10	-	-	-	666			10
	95	14	-	-	6	-	-	-	-	-	20	-	-	-	400			20
	00	11	-	-	-	-	-	5	-	-	16	-	-	-	320			16
M	82	9	1	-	9	-	-	-	-	-	19	-	-	-	1266	16	27	19
	88	-	2	-	-	-	-	-	-	-	2	-	-	-	133	28	22	2
	95	72	-	-	25	-	-	-	-	-	97	-	-	-	1940	16	30	97
	00	81	-	-	9	-	-	10	-	-	100	-	-	-	2000	13	21	100
D	82	2	-	-	-	-	-	-	-	-	-	-	2	-	133			2
	88	1	1	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	04%	00%	08%	-42%
'88	36%	00%	00%	+60%
'95	00%	00%	00%	+ 1%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	1599	Dec:		8%
'88	932			14%
'95	2340			0%
'00	2360			2%

Trend Study 9-21-00

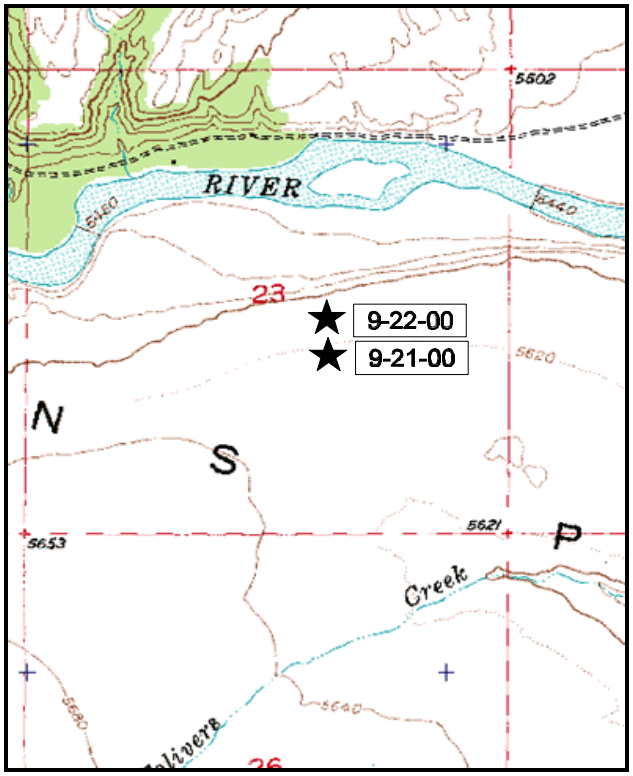
Study site name: Browns Park River Corridor-Cattle . Range type: Big Sagebrush-Grass .

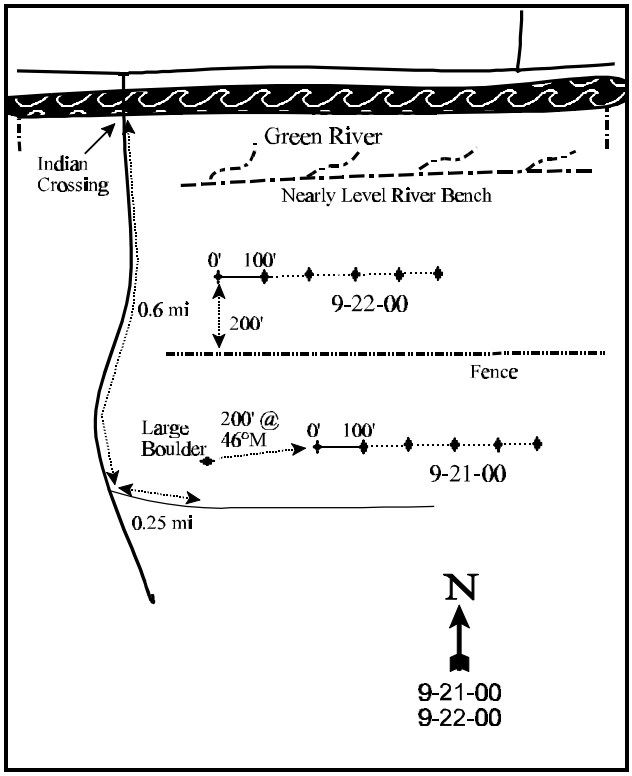
Compass bearing: frequency baseline 69°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From the Indian Crossing bridge at Browns Park travel south for 0.6 miles to a fork. Turn left onto a small road and proceed 0.25 miles. There is a large boulder on the north side of the road. From the boulder the 0-foot baseline stake is 200 feet away at a bearing of 46°M. The frequency baseline stakes are marked by green fenceposts 12-18 inches in height.





Map Name: Clay Basin

Diagrammatic Sketch

Township 2N , Range 24E ,Section 23

UTM 4528354.839 N, 654031.942 E

DISCUSSION

Trend Study No. 9-21

The Brown's Park River Corridor-Livestock study is a new study established in 2000. This study was placed to monitor differences between livestock and wildlife use on two sides of a fence line that was built in 1963. The fence was built to exclude cattle grazing on one side of the fence line while allowing grazing on the other side. Wildlife are not excluded from either side of the fence line. The area is approximately ½ mile south of the Green River at Brown's Park on a sagebrush-grass flat. This study samples the south side of the fence that is accessible to livestock. The site is nearly flat, but has a slight slope of 1-2%, and aspect is to the north. Elevation is 5,600 feet. Cattle did not graze the site in 2000. Pellet group transect data taken along the baseline estimate 31 deer days use/acre (76 ddu/ha), with no elk pellets being sampled. The cattle pats sampled in the quadrats were from the previous year and thus were not counted in the pellet transect in 2000.

Soils on the site are sandy loam in texture and moderately deep with an estimated effective rooting depth of nearly 14 inches. The effective rooting depth was estimated closer to shrubs as the interspaces were much more shallow (8 inches). Moderate pedestaling around shrub stems is common over the site. Shrub interspaces between sagebrush contain a lot of bare soil and pavement. Bare ground is estimated to cover 54% of the ground surface, while pavement is estimated at 31%. Litter is very low at 12%. Vegetation cover is moderately low at 26%, and most of this is aerial cover provided by Wyoming big sagebrush. With very little build-up of litter and so much bare soil, erosion would be much higher if not for the nearly level terrain. Phosphorus is low at 4.1 ppm as values less than 10 ppm may be limiting to normal plant growth and development. Soil reactivity is slightly alkaline (pH of 7.8).

Wyoming big sagebrush is the dominant species on the site providing over 52% of the browse cover and 37% of the total vegetative cover. Sagebrush has an estimated density of 3,740 plants/acre. Age class analysis indicates the population to consist of 64% mature, 29% decadent and 7% young plants. Twelve percent of the population shows poor vigor and use is moderate to heavy. Poor vigor and decadency are moderately high and are accentuated by the drought conditions in 2000, as well as intraspecific and interspecific competition. Other Wyoming big sagebrush sites in this unit show elevated rates of decadency and poor vigor due to low precipitation from the fall of 1999 through the summer of 2000. Leader growth is extremely low averaging 1 inch over the site.

Shadscale is also moderately abundant with an estimated population density of 1,720 plants/acre. Decadency is moderately high at 37%. Ten percent of the population shows poor vigor. This depressed condition of shadscale is drought caused and should improve with a return to normal precipitation patterns. Broom snakeweed is the most abundant browse on the site with an estimated density of 39,460 plants/acre which provide over 7% average cover. Mature plants make up 92% of the population and plants are very small statured.

Herbaceous vegetation is not very diverse and is dominated by needle-and-thread grass. This species provides 92% of the herbaceous cover on the site. Only two other perennial species were sampled, squirreltail and sand dropseed, but both are infrequent. Two annual species, cheatgrass and sixweeks fescue, were also sampled in 2000. Although these species do not currently make up a significant portion of the understory, with better precipitation in the future the potential for rapid expansion is there with a high amount of bare soil. Forbs are nearly non-existent with only 2 species being sampled in 2000.

2000 APPARENT TREND ASSESSMENT

Soils appear to be downward and are in poor condition. Bare ground and pavement cover are high, and protective ground cover from herbaceous vegetation and litter are sparse. Currently, erosion is not excessive, but only because of the nearly level slope of the site. Trend for browse also appears down as broom snakeweed occurs at a very high density and Wyoming big sagebrush has high decadency. The herbaceous understory has a poor composition with only needle-and-thread grass being abundant. Forbs are nearly non-existent and will probably never be important at this site.

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 21

Type	Species	Nested Frequency '00	Quadrat Frequency '00	Average Cover % '00
G	Bromus tectorum (a)	11	5	.02
G	Sitanion hystrix	21	12	.18
G	Sporobolus cryptandrus	20	5	.36
G	Stipa comata	300	94	6.61
G	Vulpia octoflora (a)	3	1	.00
Total for Annual Grasses		14	6	0.03
Total for Perennial Grasses		341	111	7.16
Total for Grasses		355	117	7.19
F	Sphaeralcea coccinea	8	3	.01
F	Townsendia incana	7	3	.01
Total for Annual Forbs		0	0	0
Total for Perennial Forbs		15	6	0.03
Total for Forbs		15	6	0.03

BROWSE TRENDS --
Herd unit 09 , Study no: 21

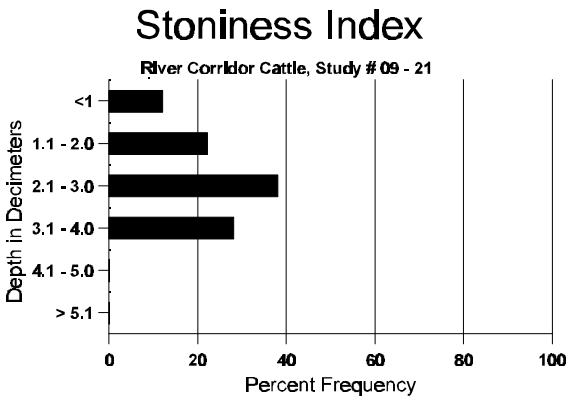
Type	Species	Strip Frequency '00	Average Cover % '00
B	Artemisia tridentata wyomingensis	76	9.28
B	Atriplex confertifolia	56	1.25
B	Gutierrezia sarothrae	99	7.10
B	Opuntia spp.	7	.18
Total for Browse		238	17.84

BASIC COVER --
Herd unit 09 , Study no: 21

Cover Type	Nested Frequency '00	Average Cover % '00
Vegetation	378	25.92
Rock	38	.28
Pavement	456	31.00
Litter	365	12.51
Cryptogams	113	1.50
Bare Ground	450	54.47

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 21, Study Name: River Corridor Cattle

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
13.87	62 (13.94)	7.8	63.6	18.1	18.2	0.8	4.1	131.2	0.5



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 21

Type	Quadncy Frequency '00
Rabbit	5
Deer	28
Cattle	7

Pellet Transect	
Pellet Groups per Acre (ha) '00	Days Use per Acre (ha) '00
96	N/A
400	31 (76)
-	-

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 21

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
Y	00	13	-	-	-	-	-	-	-	-	13	-	-	-	260			13
M	00	43	65	11	-	-	-	-	-	-	119	-	-	-	2380	11	25	119
D	00	18	30	7	-	-	-	-	-	-	33	-	-	22	1100			55
X	00	-	-	-	-	-	-	-	-	-	-	-	-	-	480			24
% Plants Showing '00				Moderate Use 51%			Heavy Use 10%				Poor Vigor 12%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'00		3740	Dec:		29%
Atriplex confertifolia																		
S	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	00	30	2	2	8	6	1	-	-	-	49	-	-	-	980	7	12	49
D	00	31	-	-	1	-	-	-	-	-	23	-	-	9	640			32
X	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
% Plants Showing '00				Moderate Use 09%			Heavy Use 03%				Poor Vigor 10%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'00		1720	Dec:		37%
Gutierrezia sarothrae																		
S	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
Y	00	48	-	-	-	-	-	-	-	-	48	-	-	-	960			48
M	00	1821	-	-	-	-	-	-	-	-	1682	-	139	-	36420	4	6	1821
D	00	104	-	-	-	-	-	-	-	-	6	-	24	74	2080			104
X	00	8	-	-	-	-	-	-	-	-	8	-	-	-	1700			85
% Plants Showing '00				Moderate Use 00%			Heavy Use 00%				Poor Vigor 12%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'00		39460	Dec:		5%
Opuntia spp.																		
M	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140	3	12	7
D	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing '00				Moderate Use 00%			Heavy Use 00%				Poor Vigor 00%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'00		160	Dec:		13%

Trend Study 9-22-00

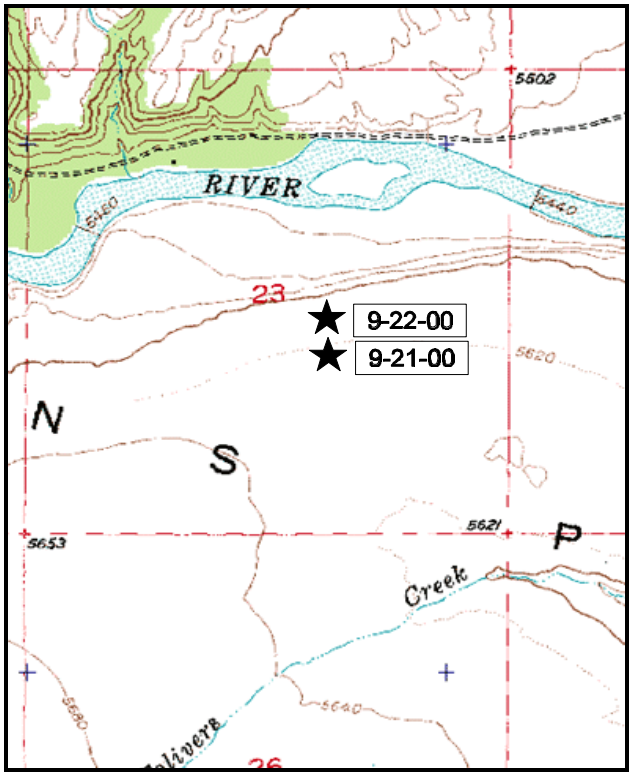
Study site name: Browns Park River Corridor-Wildlife . Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 68°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

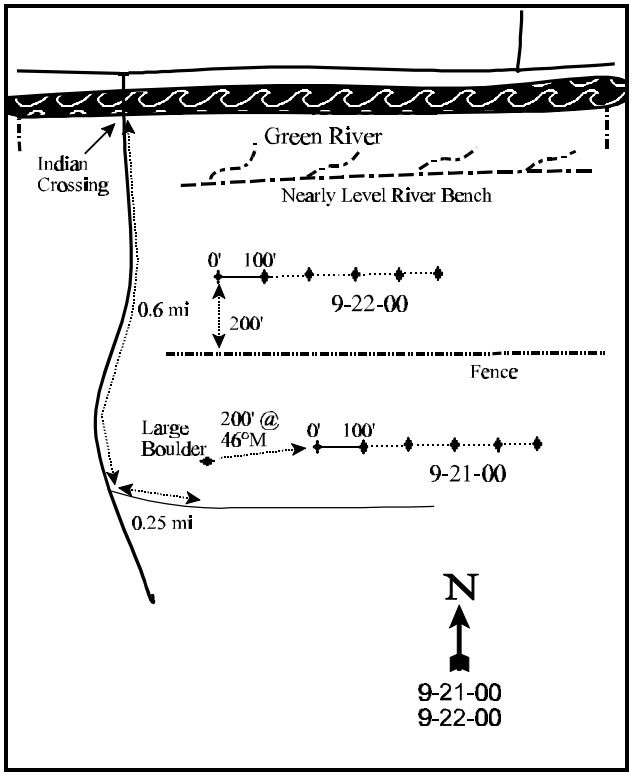
LOCATION DESCRIPTION

From the Indian Crossing bridge at Browns Park travel south for 0.6 miles to a fork. Tun left onto a small road and proceed 0.25 miles. There is a large boulder on the north side of the road. From the boulder walk north to the fence at a bearing of 0°M. From the fence the 0-foot baseline stake is another 200 feet away. The frequency baseline stakes are marked by green fenceposts 12-18 inches in height.



Map Name: Clay Basin

Township 2N , Range 24E ,Section 23



Diagrammatic Sketch

UTM 4528444.094 N, 654014.211 E

DISCUSSION

Trend Study No. 9-22

The Brown's Park River Corridor-Wildlife study is a new site established in 2000. This study was placed to monitor differences between livestock and wildlife use on two sides of a fence line that was built in 1963. The fence was built to exclude cattle grazing on one side of the fence line while allowing grazing on the other side. Wildlife are not excluded from either side of the fence line. This study samples the north side of the fence that is not accessible to livestock. The area is approximately ½ mile south of the Green River at Brown's Park on a sagebrush-grass flat. The site is nearly flat, but has a slight slope of 1-2% and a north aspect. Elevation is 5,600 feet. Pellet group data taken along the baseline in 2000 estimates 40 deer days use/acre (99 ddu/ha). Soil is a sandy loam in texture and moderately deep with an estimated effective rooting depth of over 13 inches. Soil reactivity is moderately alkaline (pH of 7.9) and phosphorus is low at 3.9 ppm. Phosphorus levels below 10 ppm may limit normal plant growth and development. Bare soil is high at 40%, while protective cover from vegetation and litter are moderately low at 28% and 21% respectively. Pavement is abundant on the surface at an estimated 20% cover. Presently, erosion is minimal due to the gentle slope and the abundance of grass cover (74% of total vegetation cover).

Wyoming big sagebrush is the dominant browse and key species on this site. Density is estimated at 2,240 plants/acre with high decadency (46%) and low recruitment (1%). In addition, 63% of the decadent class is classified as dying which represents 660 plants/acre that could be lost to die-off. With recruitment being low, this population could decrease in the future. Poor vigor is high at 32%, and leader growth is low averaging only 2-3 inches in 2000. Use is mostly light to moderate with low heavy use (2%). With big game use being light at the present time, high decadency, poor vigor and low recruitment can be attributed to drought, intraspecific competition between sagebrush plants and interspecific competition with needle-and-thread grass. Drought related increases in decadency and poor vigor in sagebrush communities have been documented on several other trend studies in this region in 2000. With high competition from needle-and-thread and very low precipitation, young plants will have a difficult time becoming established and persisting on this site.

Other browse sampled on this site are: shadscale, broom snakeweed and pricklypear cactus. Shadscale is estimated at 2,340 plants/acre, with the population consisting mostly of mature and decadent plants. Like Wyoming big sagebrush, percent decadency is high at 36% and recruitment is low at 2%. Those with poor vigor is estimated at 15%. Again, drought and competition with sagebrush and needle-and-thread are likely the key factors influencing these downward parameters for shadscale. Broom snakeweed is present, but is not nearly as abundant as it is on study 9-21 across the fence line. Density is estimated at 1,740 plants/acre, with very high decadency at 64%. Drought and high competition with other species appears to be getting the best of the snakeweed population here.

The herbaceous understory is comprised of mainly one species, needle-and-thread grass. This species provides over 18% average cover on the site, which represents 95% of the herbaceous cover and 70% of the total vegetative cover of the site. Squirreltail and sand dropseed are present in low frequencies as well. Two annual species, cheatgrass and sixweeks fescue, were sampled but are insignificant. Forbs are very rare with only two species being sampled in 2000.

2000 TREND ASSESSMENT

Trend for soil appears stable. Although litter and vegetation cover are moderately low and bare ground is abundant, erosion is not severe due to the gentle slope and abundant cover from needle-and-thread grass. Browse is currently in poor condition with high decadency and poor vigor on Wyoming big sagebrush and shadscale. Recruitment from young plants is low for both species. Drought and high competition are apparently the key

factors influencing these downward parameters. The herbaceous understory appears stable, but composition is poor with needle-and-thread dominating the site. All other species, both grasses and forbs, are insignificant on this site.

HERBACEOUS TRENDS --
Herd unit 09 , Study no: 22

Type	Species	Nested Frequency '00	Quadrat Frequency '00	Average Cover % '00
G	Bromus tectorum (a)	8	4	.04
G	Sitanion hystrix	42	20	.80
G	Stipa comata	324	96	18.66
G	Vulpia octoflora (a)	4	1	.03
Total for Annual Grasses		12	5	0.07
Total for Perennial Grasses		366	116	19.47
Total for Grasses		378	121	19.54
F	Descurainia pinnata (a)	5	1	.00
F	Townsendia incana	1	1	.00
Total for Annual Forbs		5	1	0.00
Total for Perennial Forbs		1	1	0.00
Total for Forbs		6	2	0.00

BROWSE TRENDS --
Herd unit 09 , Study no: 22

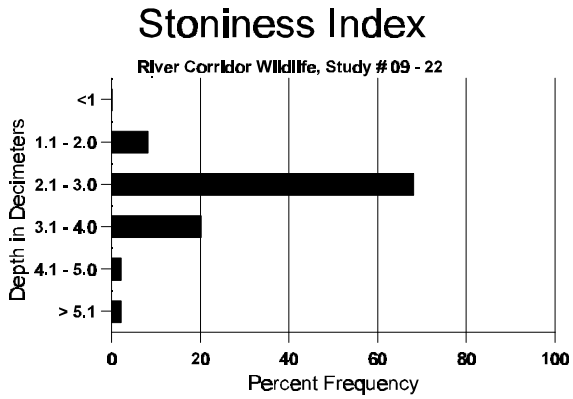
Type	Species	Strip Frequency '00	Average Cover % '00
B	Artemisia tridentata wyomingensis	53	3.39
B	Atriplex confertifolia	72	2.25
B	Gutierrezia sarothrae	28	.73
B	Opuntia spp.	10	.56
Total for Browse		163	6.94

BASIC COVER --
Herd unit 09 , Study no: 22

Cover Type	Nested Frequency '00	Average Cover % '00
Vegetation	353	27.92
Rock	23	.07
Pavement	381	20.76
Litter	442	30.07
Cryptogams	260	6.69
Bare Ground	410	40.15

SOIL ANALYSIS DATA --
Herd Unit 09, Study # 22, Study Name: River Corridor Wildlife

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
13.50	62.2 (13.70)	7.9	59.6	23.1	17.3	0.7	3.9	150.4	0.5



PELLET GROUP FREQUENCY --
Herd unit 09 , Study no: 22

Type	Quadncy Frequency '00	Pellet Transect	
		Pellet Groups per Acre (ha) '00	Days Use per Acre (ha) '00
Rabbit	9	296	N/A
Deer	24	513	40 (99)
Grouse	-	9	N/A

BROWSE CHARACTERISTICS --
Herd unit 09 , Study no: 22

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
Y	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	00	51	6	2	-	-	-	-	-	-	56	-	3	-	1180	12	22	59
D	00	40	12	-	-	-	-	-	-	-	19	-	-	33	1040			52
X	00	-	-	-	-	-	-	-	-	-	-	-	-	-	2360			118
% Plants Showing '00				Moderate Use 16%			Heavy Use 02%				Poor Vigor 32%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'00		2240	Dec:		46%
Atriplex confertifolia																		
Y	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	00	42	1	-	28	2	-	-	-	-	72	-	1	-	1460	8	14	73
D	00	33	-	-	9	-	-	-	-	-	25	-	2	15	840			42
X	00	-	-	-	-	-	-	-	-	-	-	-	-	-	400			20
% Plants Showing '00				Moderate Use 03%			Heavy Use 00%				Poor Vigor 15%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'00		2340	Dec:		36%
Gutierrezia sarothrae																		
M	00	29	-	1	1	-	-	-	-	-	16	-	15	-	620	5	7	31
D	00	55	-	-	1	-	-	-	-	-	1	-	4	51	1120			56
X	00	-	-	-	-	-	-	-	-	-	-	-	-	-	640			32
% Plants Showing '00				Moderate Use 00%			Heavy Use 01%				Poor Vigor 80%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'00		1740	Dec:		64%
Opuntia spp.																		
M	00	12	-	-	-	-	-	-	-	-	12	-	-	-	240	3	12	12
D	00	1	-	-	-	-	-	-	-	-	-	-	1	-	20			1
% Plants Showing '00				Moderate Use 00%			Heavy Use 00%				Poor Vigor 08%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'00		260	Dec:		8%

BROWN'S PARK RIVER CORRIDOR TREND STUDY COMPARISON

Trend studies 9-21 (River Corridor-Livestock) and 9-22 (River Corridor-Wildlife)

2000 data comparisons

	River Corridor-Livestock (accessible to livestock)	River Corridor-Wildlife (inaccessible to livestock)
Wyoming big sagebrush		
Average cover (%)	9.2	3.4
Density (plants/acre)	3,740	2,240
% young	7	1
% decadent	29	46
% decadent/dying	40	63
% poor vigor	12	32
Shadscale		
Average cover (%)	1.3	2.3
Density (plants/acre)	1,720	2,340
% young	6	2
% decadent	37	36
% decadent/dying	28	36
% poor vigor	10	15
Broom snakeweed		
Average cover (%)	7.1	0.7
Density (plants/acre)	39,460	1,740
Needle-and-thread grass		
Average cover (%)	6.6	18.7
Ground cover		
Vegetation cover (%)	25.9	27.9
Litter cover (%)	12.5	30.1
Bare ground (%)	54.5	40.2

Although total vegetation cover is about the same on both sides of the fence line, the nature of the vegetation is quite different. Seventy-one percent of the vegetation cover on the livestock accessible side comes from browse with only 29% being provided by herbaceous species. In contrast, 74% of the vegetation cover on the side not accessible to livestock (no grazing) is provided by herbaceous species, with only 26% coming from browse. Litter cover is low on both sides of the fence, but extremely so on the side accessible to livestock grazing. Bare ground is high on both sides of the fence as well, but more so on the side where livestock grazing occurs.

Herbaceous vegetation consists primarily of one species on both sites, needle-and-thread grass. However, this species provides nearly 3 times more average cover on the side not grazed by livestock.

The shrub component on these sites appears to be suffering from drought and competition. Wyoming big sagebrush and shadscale on both sites show high decadency and a higher than normal proportion of plants displaying poor vigor. With use currently being mostly light to moderate on both sites, high decadency and poor vigor can be attributed more to drought and competition than to any other factors. Decadency in the Wyoming big sagebrush population is higher on the side not accessible to livestock grazing. Recruitment from young plants is much lower for both sagebrush and shadscale on this side of the fence as well. Shrubs have higher competition on the side not accessible to livestock grazing because needle-and-thread grass provides nearly 3 times more cover. Thus, there are fewer microsites available for young plants to establish due to higher perennial grass cover, and more competition for resources.

SUMMARY

MANAGEMENT UNIT 9 - SOUTH SLOPE

Management unit 9 has 22 trend studies, of which 20 were read in 2000. Two sites, Toliver Creek P-J and Mud springs Draw were not read in 2000. The study at Toliver Creek in the untreated pinyon-juniper was not read because it is in very poor condition and very little wildlife use is present on the site. This study was originally established to compare with the adjacent Toliver Creek Chaining study (9-10). It may be reread in the future but it is apparent that no significant changes have taken place since 1995. The study at Mud Springs Draw was also not read due to road closures and lack of access.

In 2000, the browse and herbaceous understory components on the majority of studies in this unit show negative characteristics due to drought. Of the trend studies read in 2000 (excluding new studies):

- The key browse species, most notably Wyoming or mountain big sagebrush, have increased decadency on 15 sites (83%)
- Wyoming and/or mountain big sagebrush has increased poor vigor on 10 sites (56%)
- Sum of nested frequency for perennial grasses decreased on 13 sites (72%)
- Sum of nested frequency for perennial forbs decreased on 17 sites (94%)

Increases in decadency and poor vigor in key browse populations, specifically sagebrush, did not result in a downward browse trend on most studies in 2000. Only 3 studies were assessed as having a downward or slightly downward browse trend. However, increased decadency and poor vigor should be watched closely in the future for further increases in these 2 key parameters. Herbaceous vegetation, primarily perennial forbs, appear to have been negatively effected significantly by drought in 2000. Ten studies were assessed as having down or slightly down herbaceous understory trends in 2000, with the primary factor being decreased sum of nested frequencies for perennial grasses and/or forbs due to drought. Normal precipitation in the future will improve decadency and poor vigor in shrub populations and result in increases in frequency for herbaceous species.

Trend Summary

	Category	1982	1988	1995	2000
9-1 Red Mountain Allotment	soil	est	4	4	2
	browse	est	2	4	2
	herbaceous understory	est	4	2	1
9-2 Taylor Mountain	soil	est	5	4	3
	browse	est	5	3	3
	herbaceous understory	est	5	3	3
9-3 Dry Fork Mountain	soil	est	4	4	3
	browse	est	3	4	3
	herbaceous understory	est	5	4	3
9-4 Sawtooth - Flat Spring	soil	est	4	4	3
	browse	est	4	3	3
	herbaceous understory	est	4	3	2
9-5 Island Park	soil	est	2	4	2
	browse	est	2	1	1
	herbaceous understory	est	5	4	1
9-6 Above Steinaker Draw	soil		est	3	3
	browse		est	4	2
	herbaceous understory		est	3	2
9-7 Warren Draw	soil	est	3	3	3
	browse	est	4	4	3
	herbaceous understory	est	5	5	2
9-8 Rye Grass	soil	est	3	4	3
	browse	est	2	4	3
	herbaceous understory	est	5	1	2
9-9 Little Hole	soil	est	5	4	3
	browse	est	3	4	3
	herbaceous understory	est	5	3	2

(1) = down, (2), slightly down, (3) = stable, (4) = slightly up, (5) = up
(est) = site established, (NR) = site not read

	Category	1982	1988	1995	2000
9-10 Toliver Creek Chaining	soil		est	5	2
	browse		est	4	4
	herbaceous understory		est	1	4
9-11 Toliver Creek P-J	soil		est	4	NR
	browse		est	1	NR
	herbaceous understory		est	4	NR
9-12 Brown's Park P-J and Burn	soil		est	5	4
	browse		est	5	3
	herbaceous understory		est	5	4
9-13 John Starr Flat	soil	est	3	3	2
	browse	est	4	4	3
	herbaceous understory	est	3	2	3
9-14 Red Pine Canyon	soil	est	3	3	4
	browse	est	3	3	3
	herbaceous understory	est	4	1	3
9-15 Mud Springs Draw	soil	est	4	4	NR
	browse	est	4	4	NR
	herbaceous understory	est	5	3	NR
9-16 Mosby Mountain	soil	est	3	4	4
	browse	est	3	3	3
	herbaceous understory	est	5	2	2
9-17 Farm Creek	soil			est	3
	browse			est	3
	herbaceous understory			est	3
9-18 Gooseberry Spring	soil	est	3	4	2
	browse	est	5	4	3
	herbaceous understory	est	5	2	1

(1) = down, (2), slightly down, (3) = stable, (4) = slightly up, (5) = up
(est) = site established, (NR) = site not read

	Category	1982	1988	1995	2000
9-19 Mosby Mountain South	soil		est	3	2
	browse		est	1	3
	herbaceous understory		est	5	3
9-20 Seep Hollow	soil	est	3	4	3
	browse	est	3	4	3
	herbaceous understory	est	3	5	2
9-21 Brown's Park River Corridor-Livestock	soil				est
	browse				est
	herbaceous understory				est
9-22 Brown's Park River Corridor-Wildlife	soil				est
	browse				est
	herbaceous understory				est

(1) = down, (2), slightly down, (3) = stable, (4) = slightly up, (5) = up
(est) = site established, (NR) = site not read